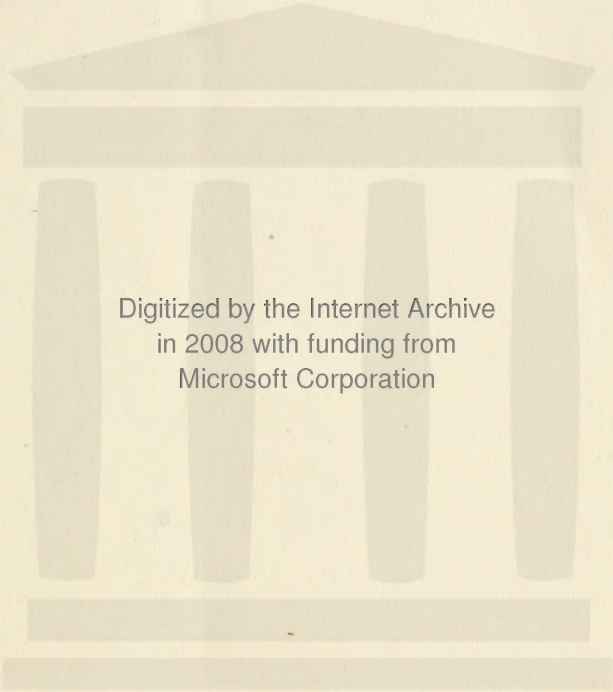

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EDITOR
JAMES E. RUSSELL

DIRECTORS
MAURICE A. BIGELOW
EDWARD L. THORNDIKE
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STUDIES IN ELEMENTARY SCHOOL PRACTICE

EDITED BY
FREDERICK G. BONSER
Professor of Industrial Education, Teachers College
Columbia University

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A CORRECTION

The article on "Teachers' Compulsory Insurance" in the November, 1910, issue of this magazine should have been credited to Charles Allen Prosser, Deputy Commissioner of Education in Massachusetts.

TEACHERS COLLEGE RECORD

Vol. XII JANUARY, 1911 No. 1

STUDIES IN ELEMENTARY SCHOOL PRACTICE

INTRODUCTION

Although the units of elementary school work here offered are fragmentary, it is believed that a unified, underlying basis of organization may be traced through them. The basis for securing this unity lies in motivating all school work by some phase of the child's experience. The child's developing life is a unity. Some need felt by the pupil as a result of environing conditions, or as created by the teacher's direction, is the ideal point of departure for every phase of school work which helps the child in his reconstruction of experience. These examples of work may be helpful in showing how some phases of everyday experience lead out and give real meaning and worth to subject matter which in itself may seem remote from child life.

The report of the Committee on the Teaching of Technical Grammar is the first fruitage of a movement begun in the last summer session of Teachers College in Professor McMurry's classes in the supervision of instruction. The organization of a coöperative group of practicing teachers for constructive study, each on a specific problem in school practice, is a most hopeful sign of progress. A number of preliminary reports have been received from members of this group with the promise of final reports in February. The measure in which these brief studies may be taken as illustrations of fundamental principles pointing to their further application is the measure of their justification.

FREDERICK G. BONSER

COOPERATIVE RESEARCH WORK IN SCHOOL PRACTICE

Many substantial contributions have been made in the formulation and rationalization of educational theories and principles in America. Much has also been done in the development of methods for the scientific study and testing of school conditions and school practice. But the actual application of principles to problems of daily school work in a way to give measurable results has been relatively neglected. Attempts have been isolated and fragmentary. A number of those made have been wanting in the rigorous accuracy and thoroughness demanded in other fields of scientific study. This state of affairs leaves us with a multitude of unanswered questions in almost every phase of educational procedure. *Opinions* abound but *evidence* is wanting.

With the feeling that the time had arrived for a general attack of the concrete problems in school practice in a manner which will give measurable results in the form of tangible evidence, one hundred and ten students in Professor Frank M. McMurry's classes in the supervision of instruction in the Teachers College summer school of this year agreed to participate coöperatively in carrying out the following propositions submitted by a committee chosen by themselves:

"We seek to modify the course of study and school practice gradually, through eliminations, substitutions, and modifications of method. We will immediately apply ourselves to the following:

1. Well worked out specific aims or problems.
2. Socialized situations in school work.
3. Instances of good motivation.
4. Instances of concrete school work.
5. Modifications of method tending to vitalize school work.

The foregoing are suggestive merely. The idea is to get any of your efforts along the lines of our work this summer.

By Dec. 1, each member of the group should send in a statement of his line of effort, or specific problems, together with a statement of any advancement made. By Feb. 1, 1911, a detailed statement of accomplishment along suggested lines should be submitted.

All correspondence should be directed to Mrs. Florence V. Watkins, 94 Lawrence Street, New York City, who will undertake to work with Professor McMurry and the Committee in editing the results. Do all correspondence on cards or stiff paper 3″ x 5″, and at the top of the first page always place name, and line of interest. Enclose a stamp for reply.

The 110, or more, persons interested include twenty-two normal school directors and teachers, twenty-one city superintendents, eleven high school teachers, five primary teachers, four primary supervisors, four grade principals, three assistant superintendents, three high school principals, three grade supervisors, two county superintendents, etc."

Inasmuch as this movement had its origin in Teachers College, and as the character of the work of the Speyer School, the school of practice and experimentation in Teachers College, is now to take on much more than ever before the nature of a demonstration and testing laboratory in daily school practice, it seems wholly desirable and proper that the coöperative investigation should be directed from Teachers College. For this purpose, a chairman or editorial director has been provided by Teachers College in the person of Professor F. G. Bonser of the School of Industrial Arts and Director of the Speyer School to work in coöperation with Professor McMurry, Mrs. Watkins, and the Committee. A department of the Teachers College Record has also been generously opened to the Committee as the medium for publication of such results of study as seem worthy of general circulation among working teachers.

Participation in the work of this committee is secured by payment of a fee of $1.50 which includes one year's subscription to the Teachers College Record, or seventy-five cents which secures the number or numbers, not to exceed two, in which

material contributed by members will appear. This fee entitles members to a copy of any reprint, or special bulletin issued by Teachers College of any material of special interest to the committee. The fee is asked simply to meet the expenditures in stenography, other clerical work, and postage, occasioned by the plan. All moneys should be made payable to the TEACHERS COLLEGE RECORD.

For those who have already subscribed for the RECORD the fifty cents additional only will be required.

Upon payment of the fee, there will be added the names of any teachers engaged in any phases of elementary or secondary school work who are willing to attempt the solution of some problem of school practice. The only limitations upon the selection of problems are that they be specific, that all conclusions be supported by measurable evidence, and that the problem when solved will be worth while.

Any person not already enlisted with the Committee who wishes to take up some phase of its work should send his name, address, position, and statement of his problem to Mrs. Watkins as soon as a specific problem is chosen. Reports of studies will appear from time to time in the TEACHERS COLLEGE RECORD.

REPORT OF A COMMITTEE ON TECHNICAL GRAMMAR

Early in the session of the last summer school at Teachers College, Professor F. M. McMurry asked for volunteers from the class in Elementary School Supervision, S133, to serve on a committee to consider the question, "Shall technical grammar, as a separate study, be taught in the elementary school?" Six women volunteered and near the close of the session made a report. The somewhat advanced standing on the question taken by the committee was perhaps not so surprising as the almost unanimous acceptance of the report as given by the whole class of over one hundred students. The report raises many questions the final answer to which can be made only as a result of several years of careful testing, recording, and comparison of results. It is presented here as an introductory study which may serve to stimulate interest in the general problem of the teaching of English, and perhaps effort here and there to establish the validity or error of its specific conclusions.

Prefatory Statement

The committee began its meetings during the third week in July and has held nine sessions. Each member has devoted between thirty and forty hours to investigation of the subject. Each one has tried to consider the various phases with an open mind and every member has endeavored to be amenable to reason.

Professor Frank M. McMurry has assisted the committee greatly by his sympathetic interest and valuable criticism. Professor Frederick G. Bonser, director of the Speyer School, has rendered valuable service by permitting the committee to use various documents in his possession.

The time has been too short for much original investigation, but material from various authorities has been collected, selected, and organized. The members of the committee feel that they

have assimilated much and hope that the other members of this class may assimilate more.

The work has been intensely interesting and it is believed that the conclusions reached will assist the members of the class to see somewhat more light on the question of how to teach technical grammar in elementary schools.

Mr. Hoyt, in his article on "The Place of Grammar in the Elementary Curriculum," in the TEACHERS COLLEGE RECORD, Nov. 1906, very aptly describes the situation as he sees it: "One of the urgent educational problems of the day concerns the need of unburdening the schools of all subject-matter that might wisely be eliminated because of its relative unimportance as educational material, thus making it possible to give adequate attention to subjects and activities found to be of sufficient value to be retained, or hereafter introduced into the schools. . . There is danger that, constrained by the necessity of giving the child a 'complete preparation for life,' the school will fail to provide for the careful assimilation of knowledge and experience so that it will reach its fruition in increased efficiency. . . We are safe in accepting as our criterion for the selection and rejection of subject-matter for the elementary schools the immediate and future needs of the pupils as social individuals." Bearing this in mind, this committee has attempted to investigate the value of technical grammar as an elementary school study.

In our discussions and for the purposes of this report, by the term "technical grammar," we mean the science of the correct construction of the English language, as that science deals with the logical analysis of the sentence into its elements, *apart from* any setting of literature or composition.

Four Claims for Technical Grammar as a Separate Study

In investigating the claims made for the study of technical grammar the committee finds a marked consensus of opinion among those who hold that technical grammar should have some place in the elementary school curriculum. It is asserted (1) that a study of technical grammar as a separate subject will teach the child to express himself correctly; (2) that it will help him to interpret the thoughts of others from the written or printed page; (3) that it will give him a standard of criticism of correct speech for him-

self and others; and (4) that it will give a basis of comparison in the study of other languages.

(1) In considering the first claim it was noted that the flexibility of the English language is one of its chief beauties and that the grammar of the language will not be fixed so long as it is a live language. Many of the rules of grammar as they have historically developed from the Greek and Latin have a limited application to the phenomena shown by good English of to-day. A few random examples of this may be given: (a) Verbs agree with their subjects in person and number. (b) Verbs, except "to be," are not inflected except in the third person, singular number. (c) Pronouns agree with their antecedents in person and number, (only personal pronouns show this by inflection). (d) The noun is inflected only in the possessive case; all rules applied to nouns apply equally well to the nominative and the objective.

At the time when English was written with the greatest vigor and beauty there was no text-book on the subject of English grammar. Again, to quote from Mr. Hoyt, "One of the misconceptions that has arisen in connection with the discussion of this subject is that the study of English has always been accompanied by the study of grammar. As a matter of fact no English grammar was available for use until near the close of the Elizabethan age, when a little grammar was published for the use of those foreigners who wished to learn the language. We see then that the language had attained its greatest vigor and beauty before the 'science of speaking and writing correctly' had been formulated."

In 1906 Mr. Franklin S. Hoyt, then of the Indianapolis city schools, conducted a series of experiments with about two hundred pupils of one of the high schools of that city. These pupils represented various elementary schools in which the subject of grammar was taught as a special study. With respect to these tests he states that "our results warrant the conclusion that the teaching of grammar is of little avail in strengthening one's power to use language."

The "Report of the Committee of Ten on Secondary School Studies" appointed by the N. E. A., in 1893 contains these words: "With regard to the study of formal grammar the com-

mittee wishes to lay stress on (the fact) that a student may be taught to write and speak good English without receiving any special instruction in formal grammar."

(2) One of Mr. Hoyt's tests, upon four stanzas of Gray's "Elegy," was entirely devoted to the grammatical analysis of the stanzas given. Another test was devoted to ascertaining the ability of the pupils to interpret the thought of the stanzas. From these tests he found that the pupils gained a high percentage in the technical grammar test but fell far below the passing mark in the one given on the interpretation of the thought, thus showing that although they had an excellent knowledge of clause structure, it helped them very little in interpreting the thought.

In summing up after a consideration of the tests he has made, he says: "The use of grammatical analysis and synthesis in the interpretation of thought is, perhaps, much overestimated. . . These cases indicate a need of more practice in thoughtful reading rather than instruction in grammar. . . Most (of these pupils) apparently depended upon the direct interpretation of the thought regardless of rules of grammar."

(3) The third claim is that such a study gives the pupil a standard of criticism of correct speech for himself and others.

The rules of grammar are based upon the practice of the best writers and speakers of our language. This makes usage the basis or standard of criticism. Then grammar is subordinated to usage. Give the child usage and he needs no grammar, for usage is our final basis of criticism.

We must remember that there is no standard grammar. Our grammar is flexible, changing each year. For example, the old potential mood has disappeared and the subjunctive is fast disappearing. "It is me" is sanctioned as correct by no less an authority than Professor Lounsbury of the department of English of Yale University. "Shall" and "will" are now used interchangeably. The use of the split infinitive is considered correct by some users of otherwise good English. Professor Krapp of the department of English of the University of Cincinnati, who supports the use of the split infinitive, says that "by the test of actual use and by the test of feeling for the modern

English idiom, the split infinitive is not only a natural, but often, an admirable expression." Furthermore, grammarians themselves on so many points of interpretation are at variance that there seems to be no universally accepted standard.

(4) There remains to be considered but one more claim for the study of technical grammar as a separate subject in elementary schools, viz., that it gives a basis of comparison in the study of other languages. For the answer to this claim, the committee begs leave to submit the following quotations from letters sent to Professor Bonser in 1907 by some of the leading Latin teachers in this country.

Professor H. J. Barton, head of the department of Latin in the University of Illinois, writes: "I am perfectly secure in my position when I say that a good Latin teacher desires a general knowledge of grammatical relations but no more. The student must be able to detect the objective relations; to know that verbs and nouns do go along together somehow, even if conjugation and declension are about done for in English; to know that there is such a thing as a subject; that there are adjective and adverbial relations,—now after that I would prefer to get hold of the student; for his grammar from that time on will be Latin not English. He will run to his Latin to get his view of grammatical relations in English. So I should say that when you have given the student a knowledge of the general knowledge-relations, he has all that it is profitable for him to take. If he has less, you would cripple him in his Latin; if more, it is better learned in Latin than in English. A further knowledge of grammar has no effect on accuracy of speech. We do not think of *grammar* when we talk."

Professor Henry C. Pearson, Principal of the Elementary Department of the Horace Mann School, Teachers College, Columbia University, says: "I may say I have been a teacher of Latin for six years, and am the author of a beginners' Latin book; therefore I am naturally much interested in the general problem of preparation for beginning Latin. Without hesitation I should say that technical English grammar should be postponed as late as possible before the beginning of Latin. As a matter of fact, it is necessary that no more than the general

elements of English grammar should be taught before Latin is begun. The more difficult parts of English grammar will be thoroughly understood only as they come up in connection with the study of Latin. Therefore I see no reason for spending a great amount of time in the elementary school in a fruitless attempt to make these technicalities intelligible to the grammar grade student."

From Professor Frank W. Kelsey, head of the department of Latin of the University of Michigan, come these words. "If boys and girls of the age of twelve could be placed in Latin classes under a good teacher, they would later derive much more benefit from the study of English grammar than without the previous study of Latin. This view is based partly upon the experience of my own children in school; through enforced precision in the use of English in translating from Latin, and the consequent correcting of all erroneous forms of speech in all departments of study, children may be trained to write and speak correctly both more easily and more effectively than through the technical study of grammar at a time when they are only partially able to comprehend it. I cannot now recall an instance of a successful attempt to correct erroneous habits of speech through the study of technical grammar alone."

The opinion of Professor John C. Kirtland, head of the department of Latin, Philips Exeter Academy, Exeter, N. H., is of especial interest: "It has seemed to me that too much time is given in most schools to formal instruction in English and too little attention to the cultivation of correct usage of speech in writing. Even this latter thing may be done in so perfunctory a way as to produce no lasting effect, and the study of English grammar is usually altogether without real helpfulness to the reading, the writing, or the speech of the pupil. . . As a matter of fact, I do not see any difference between the boys who come to us as regards their knowledge of English grammar. They all know nothing of it, without exception, not even the commonest terms. Although I am quite content to teach them much of the formal grammar they need for Latin study, there are some things they ought to know thoroughly: the subject and its case; the object and its case; the form of the possessive; what a predicate adjective is; the inflection of the verb; the parts

of speech and their functions; the difference between subordination and co-ordination."

The Appropriate Place for Technical Grammar as a Separate Study

Since grammarians and others of authority agree that the aims in teaching technical grammar are the four mentioned, and since the bulk of evidence which the committee has examined seems to prove that these purposes are not gained by a study of technical grammar as such in the elementary school, then it would seem best to dispense with the teaching of technical grammar as a separate study in these grades. Regarding the place in the curriculum where it might be advantageous to take up this technical study as a separate subject, the committee understands that to be a question outside the domain assigned for investigation. We are supported in this decision by Mr. Hoyt whom we have before quoted: "Postpone the study of formal grammar as a distinct subject till some time in the high school course, giving attention in the elementary school to only such grammatical forms as naturally evolve in the training in the use of language, and will be found of real value as an essential part of the pupil's usable equipment." We are still further supported by Professor Whitney in his "Essentials of English Grammar" when he concludes: "It is constant use and practice, under never-failing watch and correction, that makes good writers and speakers: the appreciation of direct authority is the most efficient corrective. Grammar has its part to contribute, but rather in the higher than in the lower stages of the work. One must be a somewhat reflective user of language to amend even here and there a point by grammatical reasons; and no one ever changed from a bad speaker to a good one by applying the rules of grammar to what he said."

Aims of Language Teaching

As an introduction to the question what part of technical grammar shall be retained in the elementary school, the committee would offer the following extract from "Special Method in Language" by Professor C. A. McMurry: "The results of our language lessons are miserably poor. Pupils on finishing

the grammar school cannot write a good letter or express themselves effectively, in spite of the fact that we have spent as much time upon this as on any other study. Language, of all studies, is long and strong on the side of the application. It never halts. One must become either a master of speech or a bungler. Some studies, like grammar or geography, may be chiefly theoretic, but language is for use in constantly new and varying situations. At every step, in every study, there must be a mental alertness and tension to get correct utterance adequate to the thought. This gives a practical turn to language work that is unequalled among studies. Skill in other studies may be lost and facts forgotten without any apparent damage, but power and efficiency in speech depend upon one's ability to retain and use what he has previously gained."

Phases of Technical Grammar Appropriate to the Elementary School

In beginning a consideration of what grammatical facts shall be taught in addition to what is usually meant by language and composition, we suggest the teaching of the fundamental and indispensable portions of technical grammar, not as a separate subject, but in connection with various other studies. Since the study of technical grammar as a separate subject does not meet the claims made for it by those who would keep it in the elementary school, the committee intends to show in the latter half of this paper, that grammar should be taught whenever and wherever the need arises in the school-life of the child. This will mean the elimination of much that has been embodied in technical grammar that is too abstract for the stage of the pupil's development in the elementary school and is not essential to correct expression or interpretation of written thought. We approach the subject, not through the medium of a text-book exclusively devoted to the subject as in technical grammar, but through the daily school work of the child and the content of his various studies. Thus literature and composition become the *great* fields in which grammar shall be taught.

In support of the proposition that grammar taught in this way will aid the child to express himself correctly, the committee offers the following opinions of writers upon the subject, who

make use of the term "language" instead of the term "grammar" as the committee uses it.

"The aim of language work in our schools is to make every child a master of good English for common use. It is strictly utilitarian . . and points toward the highest idealism. . . Our language has a breadth and flexibility that fit it alike to a little child or a poetic genius." (C. A. McMurry in "Special Method in Language.")

Again, the aim of language work, as viewed by the late Professor Ruric N. Roark, is to "quicken ideas already acquired, to develop new ones, and give verbal form to both. To find out what he knows best, what he thinks most about, what stirs his feelings quickest. . . All this can be learned from reading lessons and fixed by applications in daily speech and *all* written work."

The expression of Professor Percival Chubb, Supervisor of English in the Ethical Culture Schools of New York City, puts the matter in a very satisfactory way: "The formal side of grammar should be merely an outcome of expression of lively experience with interesting thought. . . The child or youth who writes well is he who feels that he has something to say, wants to say it and say it well—to make his point. He naturally falls back, consciously or unconsciously, upon examples known to him. A workmanlike regard for his tools, a sense of responsibility toward the medium in which he is working,—this is what we want to develop; and this is developed, not by rule and injunction, but by catching the spirit and developing the conscience of the craft, through the persistent effort to practice it."

And the committee believes that all of this brings about the great aim of grammar—the sharing of ideas without social embarrassment.

Grammar so taught should help the child to interpret the thought of others from the written or printed page. Light is thrown on this matter by two authorities. Professor H. G. Buehler, English master in the Hotchkiss School, and Professor E. L. Norton of the University of Illinois. The former says: "To the question of how to become familiar with the best usage, the first answer is, read the best literature." In his article on "The Psychological Basis of Grammar," in the *Educational Re-*

view, February, 1908, the latter remarks: "The sentence is correctly considered the unit of grammatical study. . . A sentence without atmosphere dies, . . cut loose from its connections, in experience or in connected discourse and treated as a mere example in grammar, (it) changes its meaning. Every sentence has a context which is not its text. While this truth raises some practical problems of method, it also indicates what the material should be."

As an illustration showing how a knowledge of grammar will assist in interpreting written thought, one may take the first stanza of Browning's "Incident of the French Camp":

> "You know, we French stormed Ratisbon;
> A mile or so away
> On a little mound, Napoleon
> Stood on our storming-day."

A child would ordinarily read this not stopping until the close of the second line. The teacher would ask: "Where was Napoleon?" The child would probably answer: "On a little mound." "Where was the mound?" "A mile or so away." "*A mile or so away* modifies what word?" "Mound." "Read it so as to convey that thought." Then the child re-reads.

A study of grammar would also give the child a standard of criticism of correct speech for himself and others. In support of this contention Professor Chubb and Professor Wisely both come to our aid. "We shall not begin with definitions, we shall evolve definitions." And, "the laws and principles which underlie the construction of sentences are all embodied in sentences and the student may study them directly. . . Then, if he forgets the rule, he has only to examine a few sentences and re-state it for himself."

Lastly, a study of grammar should give the child a basis for purposes of comparison in the study of other languages, because for himself, in his everyday work, he has formulated his own rules and has the true feeling for grammatical relations, which can never be gained by memorizing mere words. In some of the progressive schools, the children compile their own grammars as they grow in knowledge of the fundamental relations.

Portions of Technical Grammar Specifically Taught

In considering what specifically shall be taught, we must decide our sources of material for the teaching. From "The Report of the Committee of Ten," above referred to, the following bears upon the subject: "If the pupil is to secure control of the language as an instrument for the expression of his thought, it is necessary (1) that, during the period of life when imitation is the chief motive principle, in education, he should be kept so far as possible away from the influence of bad models and under the influence of good models, and (2) that every thought which he expresses, whether orally or on paper, should be regarded as a proper subject of criticism as to language. Thus every lesson in geography, or physics, or mathematics may and should become a part of the pupil's training in English. . . If this principle is not regarded, a recitation in history or in botany, for example, may easily undo all that a set exercise in English has accomplished."

In his "Special Method in Language" Professor C. A. McMurry says: "In our better schools there are more and stronger influences at work to secure good language than ever before. The enrichment of our course of study with literature, science, geography and history, provides everywhere for a fuller and richer language. Therefore we have the indispensable basis for a most fruitful treatment of language, namely, many and varied fields of copious knowledge where language always *must* keep abreast of thought."

In a recent issue of *The Elementary School Teacher* this expression appears: "The aim is to foster a desire to express and to gain the power to express interestingly and beautifully what one has to tell. . . Clearness and conciseness are emphasized in appropriate places. Choice words, flow of sentences, style, in a simple way, are noted."

Since sentences may be correct, yet obscure and ineffective, the committee feels that stress should be laid, not alone on correctness, but on clearness, directness, and simplicity of style, all of which would introduce certain elements of rhetoric. In an uninflected language, incoherence is largely due to the wrong placing of words, phrases, and clauses, hence effectiveness should

be brought about through thought relations. Correctness itself should be regarded from a liberal point of view based on the actual practice of cultivated writers and speakers.

The plan the committee suggests is as follows:

(1) From the general field of grammar the teacher should draw those relations that can be made to function in teaching the child to speak and write his mother tongue with fluency and correctness, and to interpret and appreciate the thought of others.

(2) Certain grammatical errors should be corrected throughout all the grades and in *all* subjects. In the primary grades this may be done by means of the games, and in the intermediate and grammar grades by means of sentence construction, oral composition, and testing in elliptical sentences. The sentences for this work may be taken from written matter in any subject.

(3) The teacher should also make out lists of incorrect local expressions, and work for their correction from the first grade through the eighth grade.

The committee considers that the following list includes all that should be taught in grammar in the elementary school: the kinds of sentences as to meaning; the effective use of the three kinds of sentences as to form; the larger elements of the sentence, subject, predicate, and modifiers; the parts of speech with only such divisions as are of practical value; comparison of adjectives and adverbs; the agreement of the verb with its subject; the possessive form of nouns; case and person forms of pronouns; present, past, future, present-perfect, and past-perfect tense of verbs.

This plan eliminates formal parsing, conjugation, and intricate analysis; or, in detail,—participles, infinitives, gender, person of nouns, mood, voice, form, and future perfect tense.

Suggestions of Method in Teaching the Foregoing

This work shall not be taught haphazard and merely incidentally, but shall be adapted to the growth of the child from the first grade through the eighth grade. In the departmental work every teacher becomes a teacher of grammar as it functions

in her subject. When the children are tested as to their knowledge of these relations, the sentences chosen should be straightforward, that is, not containing involved constructions that would puzzle the adult mind.

The last question considered by the committee is in regard to the method of teaching grammar. The pupil will feel a real interest in grammar and its closeness to his life, if the teacher will cause this study to grow out of the actual and natural demands in the school-room analogous to those in his life outside. Concrete situations should be created in every way possible which will stir the pupil's ambitions and create ideals along the lines of good expression and interpretation. Opportunities will thus be afforded for the development of specific aims in connection with this subject. The school or class paper where the best literary products of the pupils are printed; the club whose constitution has to be framed and for which papers or speeches have to be prepared; the games whose rules have to be formulated; the books which the pupils write and compile in connection with their various studies; the stories to be dramatized—all these school activities afford real motives to the pupil toward language study and real situations in their experience out of which the detailed elements of this study may be presented.

In order to make our ideas clear to all, the members of the committee have prepared a few plans for lessons giving suggestions as to how to teach some of the fundamental relations used in grammar.

The first is the sentence. In the first year the direct training in English is chiefly through oral language work, reading, and games. The oral language consists of the reproduction of stories read or told by the teacher or read by the pupils, memorizing of poems, and dramatization. Conversations about the garden, care of the birds, what the children did on Saturday, the children's pets, or any other subject directly related to their activity, tactfully directed by the teacher, should lead into valuable oral composition. Here the beginnings of the forms of discourse should be made. A teacher can easily lead children into description after a remark like "I saw a new bird at our dish this morning," by simply saying, "Tell me how it looked and I will tell you its

name"; or into narration by leading out from the statement, "I played a trick on papa."

During the first half-year the work is almost wholly oral. In requiring full, clear statements, correcting errors, and through the game, making the pupils conscious of correct expressions, such as "It is I," "John *threw* the ball and I caught it," training in the use of good English is begun. As the children gain the ability to write, each child will write on the board a sentence related to these interests. Here is the place to fix the fact that a sentence begins with a capital and closes with a period or question-mark. The idea of the sentence is also closely connected with reading. From the first a teacher should call a sentence a sentence and not "a story." When the oral reading is not good, the remark, "I did not get the thought," will help to connect the idea that a sentence is the expression of a thought. Since part of the training in oral reading is to see if the audience is getting the thought, let the children from the start look up at the close of a sentence. Indirectly, this also will help to establish the idea that a sentence is the expression of a thought. Thus from the start English is connected with every line of the child's activities and very definite concepts of good usage in oral and written language are being built up.

The second is the verb. Every teacher in the elementary school has found in the written work of the children groups of words not expressing complete thought, begun with capitals, and ended with periods. These mistakes are made because the children have not the feeling for the verb, hence the specific aim for teaching the verb arises out of this need of the child. When the children are ready for this step, their attention can be called to several such phrases in their written work; for example, "After waiting two hours in the gloomy station." "He running too near the water." The children now perceive the fact that these groups of words do not say anything and therefore are not sentences. Then the class is asked to express the thought that the child probably had in mind. Comparing the phrase with the sentence, the class appreciates that the latter "tells something," and that assertion was brought about in most cases by merely changing the form of one word. When the pupils said

that the change made the group of words "tell something," they struck the key-note to the nature of the verb, viz., that the verb asserts. Now the child is ready to re-read his composition examining closely every group of words begun with a capital and closed with a period or question-mark to see if a thought is expressed by them. Thus the value to himself of sensing the verb in order to express his thought is evident to the child. The process followed is the psychological.

The third is the agreement of the verb with its subject. This also is taught informally in the lower grades, by correcting errors such as "was" for "were," "is" for "are," whenever they occur. About the third grade, sufficient examples having multiplied to allow the inductive method, the children arrive at a generalization. Continued practice in the correct use fixes the simple agreement of the verb with its subject, but we may still have to meet, in the higher grades, such errors as "Each of the boys were assigned to a place in the rear"; "A barrel of new potatoes were brought to the house this morning"; "One of the boys were late." The trouble here is confusion of the subject with the plural noun in the modifying phrase. How shall this confusion be avoided? Take, for example, the sentence, "One of the boys were late"; ask the child how many boys were late. He will answer "One." Ask him to read the sentence, omitting the modifying phrase. He reads "One were late," and immediately sees the error. He corrects it and re-reads the whole sentence, "One of the boys was late." This is legitimate analysis, for it is analysis with a purpose. He is now ready to find similar examples in literature to verify his conclusion. This comparative work and the demand that he watch his own expression, oral and written, will do more to fix correct usage than any recital of rules of grammar can possibly do.

The fourth is tense. The subject of tense should be watched throughout the grades, at first informally, though carefully. Let the specific work of the first two years be to make the child conscious of the correct use of the past tense. In the third grade show the distinction between the past and perfect forms. Suppose a child in re-telling the story of "The Bell of Atri" has mixed the past and perfect tenses of the verb "ring." In

this connection the teacher shows the distinction between "rang" and "had rung." Perhaps she has a bell in the room and allows a child to ring it. While ringing it he says, "I ring the bell"; after he puts it down he says, "I rang the bell." After he takes his seat, the question to the school, "What has he done?" will be answered in the perfect tense. The pupils notice that the third form needs an auxiliary or helping word. After such a lesson, have a story written, suggested by a picture of someone drinking at a spring or fountain to test the understanding of what has been done. In the sixth or seventh grade the word tense is introduced and the forms for present, past, and future tense taught, inductively of course. The perfect tenses should probably be left until the latter part of the seventh or eighth grade. Because sentences out of their context have a different meaning, the material for illustration is drawn from readers or other texts used by the class. The sequence of tenses is stressed at this point, and sufficient examples collected by the pupil from different sources to justify the generalization that he must reach. Only one tense at a time should be worked with specifically, and this fixed by vital exercises calling for its use—compositions, examples from geography, history, literature, and arithmetic,—until the assimilation of correct usage has been completed in its transition into habit.

The fifth is the complex and compound sentence. In teaching the underlying ideas of complex and compound sentences, the pupil may be given this through his own composition work. For example, his work in geography has entered upon Italy about which he has been reading and studying. He selects as a topic "Venice." His composition includes what he has gleaned from all sources. This is one of the sentences: "The lagoon is very calm and the stars do not twinkle in it." The force of the last sentence is weakened by the use of the compound for the complex sentence. The teacher gets from him his thought, which is that *because the lagoon* is so calm, this is the reason why the stars do not twinkle in it. He reconstructs his sentence following her suggestion and he has "The lagoon is so calm on clear nights that the stars do not twinkle in it," and he has his basis for a clause of result. At the same time he sees one thought is de-

pendent on the other or subordinate to it. Here is his idea of subordination. In the same composition the teacher will be able to show him the co-ordinate idea also, which can be done in the same way. When these are clear, he has the idea of the difference between the compound and complex sentence, and the force of the complex sentence.

Summary of Conclusions

Technical grammar as a separate study has no place in the elementary school curriculum.

Grammar should be taught wherever and whenever the need arises undivorced from the context in which the sentence is found.

The great fields in which grammar should be taught are composition and literature, although instruction should be given in connection with all other subjects.

The changes suggested consist in the method of approach and in the elimination of certain non-essentials.

No text-book in grammar is to be put into the hands of pupils except as a reference book.

Respectfully submitted, August 15, 1910:

FLORENCE V. WATKINS, Chairman,
Eighth Grade Supervisor, Speyer School,
Teachers College, New York City.

CAROLINE V. SINNAMON,
Principal, Grammar Grades and Supervisor of English, Grades V to VIII,
Practice School, State Normal School,
Oswego, N. Y.

BESSIE G. GAMBRIL,
Principal, Elementary School,
Baltimore County, Maryland.

GRACE LYMAN,
Head, Department of Psychology,
Western College for Women, Oxford,
Ohio.

ANNA L. ROAT,
Teacher, History and English,
High School, Milford, Delaware.

ANNA BROCKHAUSEN,
Supervising Principal, City Schools,
Indianapolis, Indiana.

Committee

A FEW EXAMPLES OF TEACHING UNITS PRESENTED IN SPEYER SCHOOL, FALL OF 1910

Many factors have entered into the selection of the topics and subject matter of the typical school interests which are briefly described in the papers which follow.

Perhaps the first consideration which arises when a choice of material is to be made is a survey of the actual environment in which the child exists. Pupils of Speyer School live in a congested section of a large city. This in itself determined the point of approach in most of the instances cited. The city child making a study of wheat and its significance to his life knows something about flour and cereals, as they appear in the grocery and at his home. He has some indefinite knowledge of wheat cultivation, and a vague notion of the function of the grain elevators which are much in evidence in one section of Manhattan. He sees with half awakened eyes the large milk-handling plants in his immediate neighborhood, but, as in the case of the grain elevators, school activities must supply the missing links which will help him to interpret the significance of these things in real life.

Every topic is viewed from the standpoint of its relation to all that is vital in the present life of the child. This immediate interest is to serve as a key to the larger problems of later social and industrial usefulness.

In presenting the typical units which are described in these pages, various other aims are prominent. Much emphasis is placed on the handling of materials, yet the selection of studies deals largely with such subjects as contain good thought material. The value of the ability to criticise one's own effort and the need for growth in judgment are kept in mind. Power to handle text-books, skill in finding the sources where knowledge may be tested, and opportunities for employing class and larger libraries are all controlling factors.

Such topics as those presented obviate the danger of overburdening our crowded curricula. They make possible a most fortunate correlation, for the very nature of the matter handled demands the application of many subjects. This relationing of subjects will make unnecessary the separate existence of many studies which now stand as isolated units in a school program.

AMY SCHÜSSLER,
Principal of Speyer School

A HARVEST FESTIVAL IN KINDERGARTEN AND GRADES

A. In the Kindergarten

The kindergarten program is the outcome of the experiences of the children and the teacher. The children contribute unorganized activities and unrelated ideas. The teacher, through emphasis and selection, relates, enriches, and interprets these ideas in the light of her larger experience which represents social experience. In order to interpret the isolated experiences of the individual children, the teacher must have some inclusive ideas which shall control the arrangement and the development of the program. All human experience has three aspects, relationship to nature, relationship to man, and the interpretation of these relationships. The great festivals of the year are a part of all children's experience, and as they are the outcome of the experience of the race, they seem to justify their place in the kindergarten program.

This paper is an attempt to show in a very general way the children's growing realization of the harvest idea which has its interpretation in our festival of Thanksgiving Day. This development covered a period of about two weeks. During this time, there were many other ideas suggested by the children and used by the teacher, but the development of these ideas was left until another time in the year, as they were more closely related to other phases of the program. This paper will suggest only the ideas directly related to the subject.

During the first days of school, when the children are becoming acquainted with one another and with the teacher, many treasures are brought daily to be exhibited to these new friends; marbles, dolls, mechanical toys, picture books, cigarette pictures, post cards—every teacher of small children has assumed the responsibility of being curator of this museum of curiosities and has felt the awful responsibility of returning the specimens to

the rightful owners at the end of the day. A part of each morning circle was devoted to these collections, and from their very use many suggestions arose. The mechanical toys were wound, lullabies were sung to the dolls, and little groups of children looked at the picture books. Mother Goose suggested the saying of verses by individual children, and the singing of the delightful rhythmic songs. It was all an exchange of experience. Occasionally flowers would be brought, and children who had been in the parks or country began to bring nuts and leaves and other kinds of nature material. The toys were no longer used in the morning circle, and the emphasis began to be placed on the nature material. The nature of the emphasis took the form of naming the different objects, and then in playing sense games related to their names and qualities. If there were a number of flowers of bright color, these were placed in a row, and a child was chosen, who, after looking at the different colors, closed his eyes while another child took away a flower. The little children tried to tell which color had been taken away, the older children, both the color and the name of the flower. Or, if there were a number of flowers which could be distinguished by their perfume, the child who shut his eyes tried to tell the name by smelling the flower. The names of flowers began to be associated with their qualities, and after the names of many flowers had been learned, those which were peculiar to this time of the year began to be distinguished, such as asters, golden-rod, and chrysanthemums. This idea was given form in adapting Stevenson's verse:

"Sing a song of seasons,
Something bright in all,
Flowers in the summer,
Fires in the fall."[1]

which became:

"Daisies in the summer,
Golden-rod in the fall."

The naming of the season led to a recognition of fall in a new relationship on the first cold day. One child said, "It will be winter in two weeks." Summer with its warm days

was recalled, and winter with its ice and snow anticipated. The children described the fall as " cooler than summer."

Because of the use made of the nature material, and the association with the season, by the first week in October the children began to show a new interest in bringing in outside material with some relation to the autumn idea. One morning's collection consisted of a doll, a ball, shells, clovers and wild carrot, oak leaves, chestnuts, peanuts, hickory nuts, cranberries, a potato, an orange, and an apple. But before this collection was brought certain classifications had arisen from the naming of different objects, as, " nuts," " fruits," " seeds," " flowers," and the names of these classifications used in the song as:

" Flowers in the summer,
Fruits in the fall,"

and when the harvest idea became so clear that the association between spring and fall was made, the form became,

" Blossoms in the springtime
Fruit in the fall,"

and the final expression in relation to the farmer activities was,

" Sowing in the springtime
Reaping in the fall."

As an illustration that this changing of the form by the children meant something to them in the realization of the idea, one child had brought a shining piece of quartz. Its glitter caught the eye of a " feckless " child who sang cheerfully of " stones in the fall "! This immediately called forth from some of the children, " You can get stones any time." Another added, " Except when they 're covered with snow."

The idea of classifications means something more to the teacher than lists of objects under certain names, for classification implies relationship, and relationship implies a meaning.

With this in mind, the teacher may herself supplement the children's collections with material rich in suggestion, and she may suggest the relationship between certain objects which add to their meaning. One morning, when the teacher saw both oak

leaves and acorns in the collection, and put the suggestive question, "What else grows on oak trees besides oak leaves?"—she received the prompt answer, "Oak-meal"! But often those astonishing answers which seem for the moment to "side-track" the idea, are most suggestive, and in this particular instance the children learned about "oatmeal" as to both its pronunciation and its source!

Again, when the children gathered seeds from the roof-garden, the association between the seed and the flower was made and between the nut and the tree, and the children were interested in the form, "Plant an acorn, and an oak tree comes up. Plant a marigold seed and a marigold comes up. Plant an apple seed and an apple tree grows," and so on.

Suggestive material was used in sense games, such as birds' nests, milkweed pods, chestnuts in their burrs, an ear of yellow corn, bittersweet berries. This material was arranged on a tray, with some feeling as to its beauty and contrast in color, and the game form used was:

> "Two little windows of brown or blue,
> Each of us children is looking through.
> Come, with our eyes, a game we will play,
> And see if the windows are open to-day.
> Mary shall tell us what she can see,
> While we are counting, 'One, two, three.'"[2]

Each object was chosen because of its relation to the seasonal idea, and the ideas suggested by each object enriched that idea.

There were two nests shown, a robin's nest and a yellow-bird's nest. Some of the children said that the mother and father birds made the big nest, and the baby birds made the little nest! The entire implication of the preparation of the nest by the parent birds for their young, and the care of the young was left until the spring of the year, but what was emphasized was the fact that all the birds that were little in the spring were now large birds, and that all nests were empty now, as the birds had flown south. This instance furnishes a good illustration of the relation of the teacher's emphasis to the controlling idea. It is not all one knows about a subject, nor all that the children may be able to understand, but what is relevant to the nature of

the development at a particular stage, that is brought to the children's consciousness.

The realization of the meaning of autumn as a time of change and as a preparation for winter grew from the feeling of what was common to many different things, as the leaves changing color, the nuts falling, the squirrels storing nuts, the empty nests, the birds flying south, the meadows turning brown.

One morning, when there was a collection of unusual beauty in the circle, a combination of lovely flowers and leaves of gorgeous color, this song was sung to the children:

"All things bright and beautiful,
All things great and small,
All things wise and wonderful,
Our Father made them all."[3]

This was the first time that there had been any suggestion of a religious nature except in the daily singing of the grace before luncheon. Although the song was sung without comment, the last line suggested to one child, "It must have taken a long time to make the ocean and a river." And another day the children gave a list of things that were both "bright and beautiful" and that came in the fall, as colored leaves, chrysanthemums, red apples, pumpkins, and so forth.

By the middle of October, through song, story, conversation, pictures, games, and table-work, the children had a general realization of the character of the season, and this was given form in the song:

"The crickets are calling,
The red leaves are falling,
The meadows are brown and sere.
The birds are not nesting,
The earth begins resting,
Because it 's the fall of the year."[4]

The idea of "growth," which had occurred incidentally, now began to be emphasized. The gathering of seeds from the roof-garden suggested the planting of seeds in the spring, and "In my Little Garden Bed" was played. The children enjoyed telling the names of the flowers that they had planted, and after hearing

of roses and daisies and geraniums, represented by little hands held up, with fingers spread apart, it was somewhat of a surprise to find one child who had both hands held close together and who announced that he had planted a potato! And then arose a new classification, and the children named all the vegetables that they knew as the teacher drew them quickly on the board. A sweet potato growing in a glass was brought by one of the boys. The roots were noticed particularly, and the children made the generalization that all growing plants and trees have roots, which are always under the ground.

In relation to the vegetables, the finger-play of the farmer, "How Corn Grew," was played. The children began to suggest the work of the farmer through activities which were described in the form of "The Farmer in the Dell."[5] The form was changed to describe the activity as:

"The farmer hoes his field,
The farmer hoes his field,
We 'll all sing together
While the farmer hoes his field."

This same musical form was found so flexible that it was used again in relation to the fruits and vegetables gathered in for the harvest, as

"The pumpkins gathered in,"

the children singing of different fruits and vegetables. This idea was given more beautiful form in:

"Come to the harvest as many as may,
Earth has made ready for Thanksgiving Day.
Pumpkins are lying in great golden heaps,
Out of the arbor the purple grape peeps."[6]

When the jack-o-lantern was made at Hallowe'en, the seeds were dried and saved, and the children anticipated their planting in the spring. They enjoyed saying, "First seeds, then the stem, then roots, then leaves, then a flower, then a pumpkin! Then more seeds, another stem, other roots, other leaves, other flowers, more pumpkins!"—thus beginning to realize the whole cycle of sowing and reaping.

On October 14th the children went with the whole school

to the country to visit a real farm. The day was a complete realization of what had been anticipated for a month. The children spontaneously sang their fall songs as they saw the beauty of the autumn coloring. The field of stacked corn suggested "The corn is stacked so high." They actually saw "pumpkins lying in great golden heaps," and the purple grapes hanging in the arbor. They saw red apples on the tree. They saw corn growing and corn being gathered and corn drying for seed under the eaves of the quaint old house. The delivery of produce in the city was suggested by tomatoes that were being packed in boxes, and "Tomatoes gathered in," sang the children. The description of what they saw by singing was so vivid to them, that when a few days later a harvest song was sung in which were the lines, "Hear the happy children, singing in the fields," one child said, "We were happy," and another added, "And we were singing in the fields." One of the children described the experience in what he called "A Poem."

THE HARVEST

"This is the harvest. Now the apples are falling. All the fruit is gathered in. The pumpkins are taken in. Now it 's near Hallowe'en. It 's near the snowflake time. The boys love to play in the snow. The pigs live in the country. The corn grows in the country.

The End."

In recalling their visit to the farm, the children made interesting comparisons between the city and the country. When asked why there were no farms in the city, they answered, "You would have to take up the car-tracks," and that there were too many houses, and one child said, "Even the empty lots are saved for other houses." From the suggestion that the city was without farms came the idea of the dependence of those in the city upon the country for their provisions, and the children traced the fruits and vegetables from the country to the city markets, and dramatized in play of wagon, train, and store. One child as storekeeper sagely asked the purchaser, "Eating or cooking apples?"—which carried us a step farther than the market to the making of an apple pie!

The corn that was seen on the farm, hung up to dry, suggested the saving of a part of all grain for seed, and the use of the rest of the grain. The process from wheat to flour, and from flour to bread, was suggested by the story of "The Little Hen and the Grain of Wheat." In this connection came the miller and the baker plays.

When the statement was made that the seed was saved and planted in the spring, one boy said, "But not the winter wheat," and that recalled the ploughing that we had seen on the farm.

When the children were working out the game of "The Farmers," which was to be their part of the harvest festival, four farmers in the center of the circle had planted the children on the outside as grain. Then the coming of the sun and rain was represented. The grain began to grow, and at last all the children were holding their hands high and singing, "Oh, see the golden grain." The farmers next suggested the cutting down of the grain. The spectacle of thirty-five children prone on the floor might be dramatic as a battle scene, but would hardly give an artistic finish to a harvest game! It was suggested to the farmers that they bind the grain, and one of the boys quickly went to two of the children on the outside of the circle and wound their arms around each other, and the grain was bound. This gave a delightful finish to the game because the children "bound in two's," unbound themselves quickly to the quickened music of "The Farmer in the Dell," and twirled merrily in pairs in folk-dance fashion while the farmers danced in a ring in the center.

The harvest festival itself was a wonderful experience to the children of the kindergarten, because the beautiful singing and dancing of the older children was another expression of what they had realized in their own experience, and to which they had tried to give expression.

To suggest the relation between the harvest and Thanksgiving Day, this verse was recited:

> "The harvest is in and market and bin
> Are filled with the fruits of the earth.
> So let us be gay on Thanksgiving Day,
> And keep it with feasting and mirth."[7]

The picture of Millet's *The Sower,* and harvesting pictures by Dupré and Breton were shown the children, and the day before Thanksgiving each child made and took home a book containing his choice of one of the pictures and the harvest verse.

In answer to "What is the harvest?" again the children named by kinds nuts, fruits, and vegetables, and the lines:

> "With sickles keen they cut it down
> And sang the 'Harvest Home,'"

suggested the farmer's joy in his completed work. In this connection was sung:

> "O, come, dear little children, come,
> Our grateful thanks to sing,
> For all the harvest gathered in,
> E'er winter storms begin."[3]

The idea at first emphasized was, "E'er winter storms begin," and in answer to the question, "What would have happened if the harvest had not been gathered in?" the children said, "No fruit to eat, no wheat to make flour for bread, no more seeds to plant to get more wheat," and so on.

The complete realization of the gathering in of the harvest came to the children through a visit to a large market where they bought fruits and vegetables and carried them back to school in small baskets where they were given away as the children's Thanksgiving donation.

The poultry at the market impressed the children because of the intimate association between a turkey and Thanksgiving, and one child said, "We have a farmer song about vegetables, why don't we have a butcher song about turkeys?" The more cheerful song of "Mr. Duck and Mr. Turkey," in the Neidlinger book,[8] was substituted.

The lines, "So let us be gay on Thanksgiving Day, and keep it with feasting and mirth," suggested to many children the turkey dinner; and even in this unsociable age, many children told joyously of "Grandma" or "Aunt Sophie" coming, or spoke of "Daddy" being at home.

On Monday of Thanksgiving week the words "Thanksgiving" were said slowly and the question asked, "Who gives thanks?" The children said, "We do." Then were said the lines:

"Who gives thanks?
Parents dear, and all the children
gathered here."

Then was asked, "For what?" and the children filled in with many things. Then the last of the verse was given:

"For all things great and small,
God our Father made them all."

When the children were asked, "Whom do we thank?" some said "the farmer," and some said, "God." Then the farmer's part, the planting, the care and the reaping, was recalled, but one child said, "God made the seeds," and others spoke of the sun and rain which no man can call down upon the earth, and one child added, "And God made the farmer." Then came a chorus. "He made millers and bakers and painters and carpenters." Yes, God made everything. Then this verse was sung to the children:

"We plough the fields and scatter
The good seed on the land,
But it is fed and watered,
By God's almighty hand.
He sends the snow in winter,
The warmth to swell the grain,
The seedtime and the harvest,
And soft, refreshing rain.
All good gifts around us,
Are sent from Heaven above;
Then thank the Lord,
O thank the Lord,
For all his love."

One child who was four years old last year, when the prayer had first been used at Thanksgiving time asked, "Can't

we say our prayer now, and not wait till Thanksgiving?" And the prayer was said.

" Father of all, in Heaven above,
We children thank Thee for Thy love.
Our food, our home, and all we wear,
Tell of Thy loving care.
Amen."

And so Thanksgiving Day was felt to be the interpretation of the harvest, for we remember how it has been said, " While the earth remaineth, seedtime and harvest, cold and heat, and summer and winter, and day and night, shall not cease."

Sources of Songs and Games

1. Song Primer. A. Bentley. A. S. Barnes & Co., New York
2. Timely Games and Songs. C. Reed. J. L. Hammett, New York
3. Song Stories of the Kindergarten. Patty Hill. Clayton F. Summy Co., New York
4. Song Echoes, Vol. II. Jenks. Ditson and Co., New York
5. Children's Old and New Singing Games. Marie Hofer. A. Flanagan and Co., Chicago
6. Eleanor Smith Music Course, Bk. I. American Book Co., New York
7. Holiday Songs. Emilie Paulson. Milton Bradley Co., Springfield, Mass.
8. Neidlinger Book. G. Schirmer, New York

Julia Wade Abbot

B. In the Grades

To keep alive the spirit of joy, gratitude, thankfulness, and appreciation of God's bounty which our forefathers felt more keenly was the purpose of the Harvest Festival held in Speyer School this October.

If the children of to-day fail to feel a thrill of gratitude for the wonderful store nature has been providing for them all summer is it not because they are too far from nature? Can the delivery of potatoes, pumpkins, fruits, and nuts at the door cause the thrill of joy to the matter-of-fact city child of to-day that the harvesting did to the little girl or boy of long ago after the labor of planting, hoeing, and gathering?

The harvest festival has ever been the expression of gratitude in which old and young took part, each feeling his right to a share in the joys of participation because each had had his share of the labor.

That the children might better appreciate the meaning of harvest the entire school was taken to a farm in New Jersey early in October where the day was spent in investigating the crops that were being gathered. As a preparation for this trip the children made lists of products one might expect to find on a farm at that time of year, and which will keep through the long, cold winter months; also what foods we are dependent on during the winter season and hence are thankful for.

The farm was a crude one but was the best that could be found at the time, and yet its very crudity may serve as a basis for comparison in a later study of improved and modern methods of farming in connection with geography.

As it was the intention of the school to have the festival an outgrowth of the regular work of the grades each teacher directed the attention of the children to the geographical features of the land and surrounding country, to the beauty and colors of nature, and to the many objects of interest both in the flowers and animals of the place. The preparation for marketing the products was noted and they were traced to their destination at the wholesale Harlem market.

In the next four weeks the regular work of the grades centered around the farm and harvest idea from the historical and geographical standpoint. The study of the seed, planting, and preparation for storing of grains, fruits, and vegetables lent itself to the nature work. In the third grade this idea was carried still further for the children made a trip to a wholesale market to see the products in larger quantities and traced them through the wholesale and retail markets to the final delivery at their own doors. This work led out naturally to problems in arithmetic of comparison of retail and wholesale prices, fluctuations in the same, and finally to the daily and weekly bills of an ordinary family, and the cost of a Thanksgiving dinner.

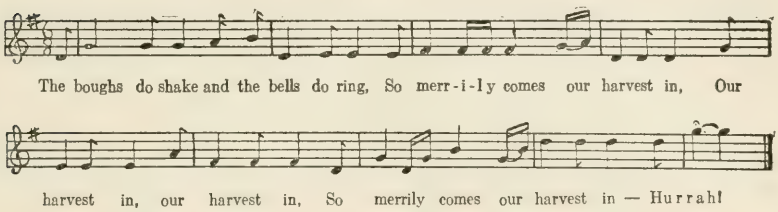
Geographical relations were brought out through this same

study of the market, such as the interdependence of one region upon another, and of the various countries, also the means of transportation and comparison of old and new methods.

Stories were read in the reading period with regard to fall nature study, and the English work was based on the trip to the farm, the meaning of harvest, and the customs of other people as expressed in their festivals.

The spirit of the festival found special expression in writing the words and composing the music of the following song:

HARVEST SONG


The boughs do shake and the bells do ring, So merr-i-ly comes our harvest in, Our
harvest in, our harvest in, So merrily comes our harvest in — Hurrah!

The boughs do shake and the bells do ring,
So merrily comes our harvest in,
Our harvest in, our harvest in.
So merrily comes our harvest in—Hurrah!

The corn 's to be husked and put in the bin,
The children all laugh with glee;
Our harvest is in, our harvest is in,
So merrily do the children sing—Hurrah!

The days grow short and the nights grow long,
The farmers chant a harvest song,
A harvest song, a harvest song,
The farmers chant a harvest song—Hurrah!

Each of the first four grades was given the first stanza and was asked to compose suitable music for it. The best tunes of each class were chosen for consideration and the above was selected from the second grade.

As special preparation for the festival the children worked out in dance form the sowing, reaping, and threshing of the farmer, followed by poses of prayer, rest, and rejoicing after the labor is done. To carry out the old English custom of the hock cart the children of the third grade prepared a cart by filling it with

fruit and vegetables, and by placing on top as the "last sheaf" a sheaf of rye which they arranged and tied in the classroom. This was later used in the grand procession of the festival and the sheaf was presented to the Master of the Harvest.

In the four upper grades the harvest festival idea was largely old and the material did not enter in a direct way into the regular school work. However, the pupils of these grades were responsible for their share in making the festival a success. Through the departments of music and physical education they learned festival songs, dances, and games. These aided very materially in making the festival itself a success.

Composing original festival songs, both words and music, was an important part of the music work just before the festival.

The sixth grade furnished the Master of the Harvest and the laborers were chosen from the seventh grade.

In the fifth grade, the harvesting and marketing of products was of especial interest because it was an important part of their geography at that time. This led into a study of the products needed in New York that have to come from a distance. The Greek harvest myth, "Demeter and Persephone," was studied and dramatized in this grade. Following is the program as given at the festival:

A HARVEST FESTIVAL

COLUMBIA CAMPUS

October Twenty-eighth, Nineteen Ten

1.30 P. M.

STORY OF THE FESTIVAL

The Master of the Harvest, with the children of the village, is waiting for the laborers, who are bringing in the "last sheaf." This sheaf, representing the Spirit of Vegetation, is to be presented amid songs and dances of rejoicing to the Master, who keeps it during the winter, and in the spring mixes it with the seed to be planted in order to insure a bountiful yield. When the rejoicing and merry-making are over, Master and people unite in a Song of Thanksgiving.

ENTRANCE OF LABORERS—Harvest Song - - Grades III. to VIII.
ORIGINAL SONG - - - - - - - - - By the School
THE MASTER OF THE HARVEST WELCOMES THE LABORERS
GAME—"Would You Know How Doth the Farmer?" - Grades I. to IV.

INDIAN SUMMER—Song - - - - - - - - By the School
GAME—"The Farmer in the Dell" - - - - - Kindergarten
HARVEST SONG - - - - - Kindergarten and Grades I. to IV.
HARVEST DANCE - - - - - - Girls of Grades V. to VIII.
RACING CONTESTS - - - - - - Boys of Grades V. to VIII.
OCTOBER—Song - - - - - - - - - By the School
PRESENTATION OF THE "LAST SHEAF" TO THE MASTER OF THE HARVEST
ORIGINAL SONG - - - - - - - - - By the School
VINTAGE DANCE - - - - - - - - - Entire School
SONG OF THANKSGIVING - - - - - - - By the School

The music of the first original song was composed by Grade II. The music of the second original song was composed by Grade VI.

ALICE THOMPSON
FRANK S. MCCALL

A MOTIVATED THANKSGIVING PROGRAM IN THE SECOND GRADE

For several years the approach of the Thanksgiving holiday has been the signal for an appropriate program in our second grade.

After more than two months' work in the second grade, the little folks seem to feel their increased power, their growth, their ability to do new and larger work. With this enlargement of power comes a correspondingly increased desire to share the results of their efforts with others. Home folks and friends have always had a part in their joys, but at this season the children seem to reach out to their schoolmates.

The first grade is the class in which the second grade children are most interested at this time, as they have passed its borders so recently. Accordingly, this year as sometimes before, we entertained the first grade and friends at our Thanksgiving program.

From year to year the nature of this Thanksgiving program depends entirely upon the line of work which has been pursued throughout the month, as it must be an outgrowth of the month's study. For instance, last year we celebrated, in play, the "First Thanksgiving"—both Indians and white men being gathered together there. This year we decided to have "Our Thanksgiving," and entertain our friends with songs and plays and stories.

The material for this program was chosen largely upon the suggestions of the children, and was formulated by them under the guidance of their teachers. History, literature, art, oral and written language, and music, all lent themselves to the work.

Following is a copy of the program:

ORIGINAL SONG—"Giving Thanks" - - - - - Grade II
POEM—November - - - - - - - - - - Grade I
SONG—Squirrel's Thanksgiving - - - - - Grades I and II
PLAY—The Tree Dwellers - - - - - - - Grade II
ORIGINAL SONG—The Boughs do Shake - - - - Grade II

"Our Feast"

While refreshments were being served the children of second grade entertained their guests with nonsense tales and riddles.

But why did these things appear on this program? And how were they handled? These are questions which may arise, and we shall tell briefly in a general way of their preparation.

During the fall months, the history period had been filled with a study of the conditions and life of the time of the Tree Dwellers. The story of their struggles and difficulties led to an appreciation of our greater benefits and comforts to-day.

One afternoon was spent on the Palisades across the Hudson River studying the land forms there. After much work a wooded hill with banks gently sloping to the river was chosen as a typical place for the children to work. Accordingly, they climbed trees, dug for roots, hunted for berries and nuts very much as the first people had to do. This helped the children to appreciate more than ever before the difficulties of such living.

After this trip the desire came to play "the tree dwellers" in their class room. Many children asked if they might dramatize the story and give it before the school. As the story was a very full and long one we decided to choose the most important parts only, and dramatize them. This afforded an opportunity for much excellent language work, and required strong organization. The following points were finally chosen:

Act 1.—Sharptooth, and her baby.
Act 2.—Bodo, the big boy.
Scene 1. Catching a wild hog.
Scene 2. Hunting for birds' eggs.
Scene 3. Stealing honey.
Act 3.—The Coming of Fire.
Act 4.—The Fire-clan.
Act 5.—Saving One-Ear's life.
Act 6.—Killing Sabretooth.
Act 7.—The Feast.

The play was developed by the children, each contributing suggestions which were considered and arranged in the best way by the help of the teacher. When the play was properly written, it was necessary to choose the players. Each child was anxious

to have a part in the performance, hence much skillful effort was put forth in thoughtful, imaginative work. Good judgment was also required in choosing those who were most capable for the work.

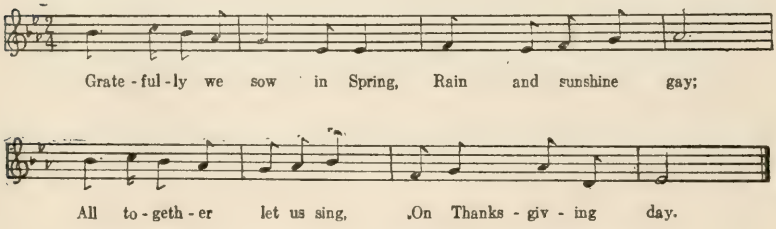
This matter settled, a few rehearsals were all that was necessary before the final presentation. All announcements were made by one of the children, and the stage management was left in their hands entirely.

One other feature of this program was the result of the children's creative work. That is the original song: "Giving Thanks." Many songs had been learned during the autumn, but at this time they wished to have one of their own making. As they did not have time to write their own verses, they were content to choose a beautiful poem and make a "tune" for that.

Four lessons were necessary to complete the following melody:

GIVING THANKS

Grade 2—1910-11. Speyer School.



Gratefully we sow in Spring, Rain and sunshine gay;
All together let us sing, On Thanksgiving day.

Heavenly Father hear our thanks, For Thy loving care;
Help us now to show our love, And each blessing share.

The first lesson was given to the choosing of a poem. "Giving Thanks" was decided upon as it emphasized the "thank you" idea, and was different from any song already known. The next three lessons were necessary for hearing the different melodies that were presented, and for selecting, altering, and improving until a satisfactory product came. Little time was required for memorizing the song, as the children had grown familiar with it while making it.

The main idea in composing this music was to make the tune tell just the same story that the words wished to tell. The song may seem crude, but it was the result of much good, live work in the music class. It shows too the children's interpretation of the lines, as the whole class contributed freely.

We have said that the first grade and friends were invited to hear this program. This means that written invitations were sent out. One language period was filled with interesting work in wording suitable invitations. They had to be very short, as the children were to write them. Following is a copy of the class invitation:

SPEYER SCHOOL, November 18, 1910.

DEAR FRIENDS:

We invite you to our Thanksgiving party, Tuesday, November 22, at half past one o'clock.

Your little friends,
SECOND GRADE.

After this had been recorded on the board by the teacher, another period was spent by the children in copying it. Careful work was done, the children doing their best in response to the fact that school note-paper and envelopes were used. Then, too, these notes were going to the first grade, to friends, and to teachers at the College.

The " feast " itself was very simple. Wholesome refreshments, consisting of popped corn and apples, were served upon plates and napkins which had been decorated by the children. Nature, art, and seat-work periods had been utilized in accomplishing this work. The children studied the fall fruits and vegetables to know more of their size, shape, and color. Then, patterns of these fruits or vegetables were cut from heavy paper and applied to toned paper. Many units were cut therefrom and arranged in suitable groups. These were then applied as decorative designs to heavy paper plates. Much splendid work resulted, showing a wealth of ideas and originality in design.

Having made the plates under the careful direction of teachers, the same ideas were carried over into the decoration of napkins. This work, however, was done entirely as seat-work.

On the afternoon of the program there came the social opportunity of caring for their guests. Mothers and friends had to be carefully ushered to comfortable seats, and thoughtfully attended throughout the function.

The whole afternoon's enjoyment was dependent upon the efforts of the little folks of the second grade. The songs, the play, the stories, all were the result of good earnest work on their part. This Thanksgiving program, therefore, had furnished the children richly with aims and purposes. It had motivated much of the work of the preceding days, and this work had its final outcome in conduct.

ELEANOR WRIGHT

CLIFF DWELLERS AND CITY DWELLERS

CORRELATIONS OF SCHOOL AND LIFE IN THE THIRD GRADE

Our sequence in history work, as arranged at present, includes a study of the Cliff Dwellers as one unit in the early part of the third grade course of study. In the second grade, the study of the tree dwellers, the cave men, and the Indians of the plains made an excellent basis for the work. The life and customs of these more primitive people were rapidly surveyed and the Cliff Dwellers were introduced as the Indians of the Southwest who lived better and had progressed further than the Indians of the plains. The term Cliff Dwellers, although not as comprehensive, was preferable to Pueblos because the children's literature was about those particular tribes whose homes were on the cliffs. Later in the work, the term Pueblos, which means villages, was used and its meaning appreciated. The children were given an opportunity to tell what they knew about the Cliff Dwellers. The item of most general interest was: "The Indian bowl in the children's library downstairs was made by a Cliff Dweller."

Pictures of these Indians were then shown and their personal appearance and clothing compared with those of the roving Indians. The children were then told of the strange environment of the Cliff Dwellers in Arizona, New Mexico, and Colorado. These states were located on the map and some idea of the distance from New York City comprehended through a knowledge of the time consumed in a direct trip. Many colored pictures were used to give a clear conception of the sand stone and desert region. It was contrasted, as regards surface, general appearance, and climate, with the country with which the children are acquainted. The cliffs were likened to the Palisades along the Hudson River, and the gorges and canyons to the narrow streets with

the tall apartments on either side in the city. Sand stone was compared with the familiar mica schist on Manhattan Island and the trap rock of the Palisades.

Early in the work the teacher began to read to the class the story of "Lolami, the Little Cliff Dweller." This classified many points, verified others, and called forth much interesting and profitable work.

A short study of the New York City water supply came in connection with Lolami's scarcity of water. This was comparatively easy as there was at the time a graphic display at the New York City Budget Exhibit showing how much water per person is supplied by the city, various ways in which water is wasted, the size of the aqueducts carrying water to the city, and so forth. The immensity of the water system was appreciated through the fact that much of the water comes from Croton Lake which is forty miles from Manhattan.

The canyons, gorges, cliffs, mesas, natural bridges, rivers, creeks, and springs mentioned in Lolami were discussed in the geography period and formed on the sand-table. On our excursion to the farm, which was made about this time, the children were even more interested in the Palisade cliffs, miniature gorges, valleys, and the Hackensack river than in the beautiful autumn foliage and the products of the farm.

In the nature work attention was given to the flora and fauna of the Cliff Dwellers' country. The children became acquainted with cacti, yucca lily, and sage bush, and talked about the reasons why they are particularly adapted to that habitat. Pictures of the plants were shown, specimens of cacti were brought to the class room, the yucca lilies on the lawns of New Jersey homes and the extensive collection of these plants at the Bronx Botanical Garden were brought to mind. Some children who were familiar with the plants gave vivid descriptions of how they looked and where they had seen them, thus helping the others to know them. The animals of the Southwest were recalled and their value as food pointed out.

A knowledge of the food used by these people was developed through the study of their environment, and the conclusions

confirmed in the stories and references. The methods of agriculture, the implements used, and the necessities for irrigation were discussed. Their preservation of foods for winter was taken up and the children experimented with drying meat and pumpkins. They were allowed to cut their pumpkins the size which they considered proper. The teacher suggested drying an entire section. The children were surprised to find how the pumpkin shrivelled and were sorry that they had cut it so small. A small piece of beef was dried. It was weighed before and after drying. The advantages of drying food and the reasons for the decrease in size and weight were developed. Written reports of this work were made in the language period and used to explain the work when the results were exhibited on the nature table in the hall. The manner of cooking was given little attention since it was quite similar to that of the Indians of the plains.

A short study of pottery and basketry was made and the children were taken to see the fine exhibit in the American Museum of Natural History. A school collection of Pueblo pottery was begun. Two of the children, whose parents had visited the Southwest, brought several characteristic specimens.

A few of the religious customs and beliefs, which could not easily be developed, were brought out through stories in the literature. "Never Kill Your Ancestors" from Lolami in Tusayan illustrates their belief in their descent from animals. Parts of chapters II, XII, XVI, XVIII, of the same book, were also told.

When the work was well along, we appreciated the fact that the father of one of the fifth grade boys is a professional lecturer. He has spent much time in the Southwest and has made an extensive study of Pueblo life. He has numerous sets of stereopticon pictures which are accurate and beautiful. We decided to ask him to come and talk to us, which he gladly consented to do. Grade IV was invited because it had had the work and would be interested. The lecture and lantern slides were excellent; many hazy points were cleared. The development of these people since the coming of the white man was demonstrated. Mr. Monsen was careful to point out which things showed the influence of civilized man. Conceptions of

distance, size, and color were received from the lantern pictures which the smaller ones could not give.

An opportunity for discussion of the lecture was given to the children the next morning and such remarks as the following were made: "I just imagined I was Lolami in some of those pictures." "I couldn't believe how hard it was for the Cliff Dwellers to get to their homes until Mr. Monsen told about his trip." "I didn't know that there could be so many kinds of cacti." "Isn't the 'painted desert' a fine name for that country?" "The pictures showed almost everything that we have learned about the Cliff Dwellers."

Early in the work, the children decided to make a model of a cliff village and so were constantly on the lookout for helpful suggestions. Later the children made, in one period, small cliff homes of clay to get suggestions for the large community model. The large model was patterned after the best of the small ones and other suggestions were taken from pictures of models. Before the house was completed two children brought ladders made of fine wire—nothing else small being available. Later more ladders were made of the fine cedar twigs of a sink-brush. The entire model was coated with brick dust to give the appearance of sand stone.

The work ended with a class story about the Cliff Dwellers, giving the principal facts in connection with the work.

Bibliography and Illustrative Material

The Pueblo Exhibit at the American Museum of Natural History. 77th Street, New York City.

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The booklet announcements of the Frederick Monsen Lectures.

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The Normal School Quarterly No. 2, State Normal School, Macomb, Illinois.

Lolami, the Little Cliff Dweller, and Lolami in Tusayan. Clara Kern Bayliss. Public School Publishing Company, Bloomington, Ill.

Books read by the children:

White Cloud, the Little Pueblo Girl, from In Field and Pasture, MAUDE BARROWS DUTTON. American Book Company.

Cliff Houses, from How We Are Sheltered, CHAMBERLAIN. Macmillan Company.

Children of the Cliff, WILEY and EDICK. Appleton and Company.

ROXANA A. STEELE

A STUDY OF THE WHEAT INDUSTRY IN THE FIFTH GRADE

In the fifth grade we took as our problem in relation to the study of our own city: "Why is New York City so important?" The children with little help developed the reasons for this, emphasis being given to the fine harbor and the facilities for sending the various products here for immediate use, to be worked over, or to be sent away. On our journey to the farm with the rest of the school in October, we had seen some of the fall fruits and vegetables, and some corn in various stages of preparation for the market near us in New York. Some of the most important of the needs of the city for food were then listed, the sources of supply briefly located, and the routes traced. Flour, one of the most important of the many products sent to us, was taken up for special study.

The children were first asked to find the names of the kinds of flour used in their own homes, and to learn if possible where they were manufactured.

It might be well to state at the outset that this was not an entirely new subject, but one that had been touched in various ways from the kindergarten up. Many of the children had been on farms at one time or another, and they lived over these experiences in our Harvest Festival when they saw "The Farmer's Song" dramatized by the kindergarten, and the children of the first four grades play through the processes from the planting to the harvesting of the grain. While the preparations for the festival were going on, a sheaf of wheat was on exhibition in the hall and also heads of several varieties of the bearded and beardless wheat. The attention of the children was called to these.

Special study was made of the wheat growing regions and the children colored outline maps of the United States showing these

sections. They became familiar with the names and locations of these states so as to find them readily on the maps.

We made a study of a wheat farm in North Dakota using chapter XXI in Carpenter's "North America" as the basis. The conditions of growth were noted; then we referred to the geographies at hand for further information concerning the surface, soil, and climate of these states.

The wheat was traced from the farm through the various milling processes. The Gold Medal exhibit consisting of a case of twenty-four bottles, each containing a sample of wheat in some stage of manufacture, was found very helpful. Carpenter, and Rocheleau's "Great American Industries" were helpful at this point. Also the previous year the children had visited the Hecker factory in this city and had seen some of the actual manufacturing processes, as well as a grain elevator, and the unloading of the wheat boats which had come through the Erie Canal to New York.

They were interested too in making their own collections of wheat products; and, under the leadership of one of the children, bottles were purchased from a neighboring drug store and the contributions of flour, feed, starch, and breakfast foods were placed in them and labeled.

Grains of wheat were given the children and they found the part out of which bran is made. Then some flour and water were mixed together making a dough. This dough ball was washed in water leaving a yellowish, elastic substance. This, we told the children, was largely the gluten part of the wheat. That which was washed out was tested and found to contain starch. This experimenting was supplemented by the use of a Gold Medal chart of a grain of wheat which indicated the five bran coats, the gluten grains, the grains of starch, and the germ. The children made greatly enlarged drawings of the wheat grain with the help of this chart, and labeled the different parts.

The information gained at home as to the kinds of flour in use was the starting point for locating the chief milling and shipping centers. These were later placed on the outline maps. The cities selected as most important were: Minneapolis, Duluth, Milwaukee, Buffalo, St. Paul, St. Louis, and Portland.

We next studied the chief shipping routes, special mention

being made of the three water routes to the Atlantic coast and the advantages of these. Two lessons were given on the Great Lakes as a water highway. Many different folders of the railroads were brought to class and the children were asked to look at the accompanying maps and make a list of these roads which would materially help in distributing wheat or its products.

The final disposition of the wheat which is sent to the seaport cities was considered by looking up the great wheat producing countries, and those which do not supply their own demand. These cities were also located on the maps.

From the various reports furnished us by the Department of Agriculture and the Department of Commerce and Labor data were found for problems which emphasized the industrial importance of wheat. The most helpful pamphlets were: "Bread and the Principles of Bread Making" and "Statistical Abstract of the United States."

After working from the uses of wheat in our own homes into the big wheat industry of the United States, the question naturally arose as to *why* wheat is such an important food. This was discussed chiefly in the three cooking lessons which the children had in connection with this study.

In these lessons the children prepared cream of wheat and white sauce, and baked bread. In connection with the first topic they discussed the question as to why cream of wheat makes a good food. This brought in review the food elements in wheat and opened the subject of expense. The cost of a cereal for breakfast was computed in an arithmetic lesson and the result compared with the cost of meat, fish, or eggs having the same value in food units. The following are illustrative problems:

1. One dish of cream of wheat costs about ½¢. Enough lean round steak to give the same fuel value costs 3½¢. What will be the difference in cost for a family of 5?

2. One very large egg has the same fuel value as a dish of cream of wheat. When eggs cost 50¢ a dozen, which costs more and how much? What would be the difference in cost for a family of 4?

Another interesting comparison was in relation to the buying of flour in large or small quantities. The children got from

the grocers the costs of the various sized bags of flour and the problems were based on the prices.

Flour may be purchased by the barrel, 196 lb., for $6.75, or in bags containing 3½ lb., 7 lb., or 24½ lb. These bags are respectively $\frac{1}{56}$, $\frac{1}{28}$ and $\frac{1}{8}$ of the barrel. The average prices which we found were: 3½ lb. for 15¢, 7 lb. for 30¢, and 24½ lb. for 90¢. The following problems are two of those used:

1. Which would be the cheaper, to buy a 24½ lb. bag of flour for 90¢, or seven 3½ lb. bags at 15¢ each? What is the difference in cost?

2. A grocer will sell a barrel of flour for $6.75, or he will sell the same amount in 56 bags, getting 15¢ for each one. On which does he make the greater profit and how much?

In cooking the white sauce the starch absorbs moisture, hence flour is used for the thickening. With the bread the children observed the action of yeast in the flour mixture and learned that the wheat with an abundance of gluten makes the best bread. In a previous year they had made a "class" loaf of bread and visited the Cushman bakery. This year they baked individual loaves which they promptly carried home the day before Thanksgiving.

At the risk of studying wheat as some children did the cow,—"from head to tail, and hide, hoofs, and hair," I will show how this study was related to or gave motives for further work.

In our Greek history it was interesting to note that wheat was one of the grains in earliest use. The class had already heard the Greek harvest myth of Demeter and Persephone. The Hawthorne version was read to them in several literature periods, and, as they were particularly interested in dramatizing they suggested playing it. About this time the date when the fifth grade was expected to entertain the rest of the school in assembly was given us, and the children at once decided to get the play ready for that occasion.

The class also used short accounts of the dramatizing, cooking, map work, and collections for the news items sent to the Speyer School weekly paper. Those whose papers were chosen for publication were quite proud to read their signed "articles" in the ambitious little sheet.

After the cooking lesson the recipes were written for future

reference. During these written exercises the words the children needed help in spelling were placed on the board. These were later used for special study for oral and written spelling, and when a number of lessons had been given the words were reviewed and used in spelling matches.

Another bit of composition which also served as a review was an imaginative story of the experiences of a grain of wheat. As this would have been a very long piece of work if written in full it was given in outline from,—topics and sub-topics. These were then used as a guide in "oral composition," that is, in telling these stories to the class. One of these uncorrected outlines is given below.

Hans Monsen. Nov. 22, 1910.

THE ADVENTURES OF A GRAIN OF WHEAT

In South Dakota
  Growing
  Being cut
  Threshing
In a grain elevator
  Being weighed
  Being cleaned
In a whaleback
In the factory
  Being ground
  Being put into bags
Sent to England
  On an ocean liner
In London
  In a home
  In the oven
  On the table

There were several opportunities for the class to write letters asking for some of the illustrative material. Finally, this study "tied up" to the art work in two ways. In making our maps we tried to find some basis for the selections of harmonious colors by studying some beautifully colored prints; and a study of *The Gleaners* and *The Sower* was made to find the elements of beauty as well as the significance of these subjects in art.

CLARA R. BENNETT

HOW THE SIXTH GRADE HAS "MOTIVE BEHIND AND OUTCOME AHEAD"

Many of the subjects taught in the elementary schools of today lack worth and interest to boys and girls because they fail to see in these subjects anything worth having or doing, or anything which supplies a felt need either of their own or of the society of which they are a part.

In most cases, pupils are not leaving our schools because of necessity but because they have lost all enjoyment and interest in school work. In Massachusetts, the recent Industrial Commission canvassed 3,157 families whose children had left school before the age of 16. Of these 3,157 families, 76 per cent could and would have kept their children in school if they had felt that it was really worth while. And, why is it not really worth while? For the reason that there is, especially in higher grades, a lack of motive, of live purpose in studies. Supply it! What happens? Pupils see the school is furnishing studies giving experiences which make for efficiency, studies which supply a real need and a clearer insight into life activities round about. They like school and therefore remain in it longer. In the sixth grade, pupils have been heard to say, "This doesn't seem like school. It 's different." "All our studies are so interesting." "Why can't we do this way all the time?"

Bring pupils to such a point that they themselves feel a need for solving problems in studies and they do not complain that they are being overburdened with subjects. They put forth more intense and continuous effort. They work coöperatively to solve these problems. Parents begin to realize that we are trying to make pupils efficient members of the community in which thy live.

Supply motive in one subject and this motive leads to others and a correlation of subjects. Isolation is overcome

and history, reading, geography, and arithmetic become the means by which real life is carried on.

Practical illustrations of the value of motive in school subjects are here offered from the sixth grade of Speyer School where the solution of this problem is in progress.

Oral reading has been a topic of much discussion, primarily because the results obtained have not been satisfactory. We realize that one difficulty in upper grades is in the material. It is too difficult to lend itself to good expression, for most of the pupil's time is expended in conquering the mechanics of the material. Teachers have urged pupils to read louder, more distinctly, and with emphasis, but still pupils read in the same old way. And why should they feel any incentive to read differently when all those in the class have the same reader? Realizing this defect in material and method, the following plan of reading is here followed.

In a class of twenty-two pupils, there are twenty-two different readers selected from a list of books which the pupils want to read. This list includes among others such books as: "Rebecca of Sunnybrook Farm," "Wild Animals I Have Known," "Bears of Blue River," "Jackanapes," "Captain January," and "Tom Sawyer."

During a reading period, a pupil is invited to share his book with the rest of the audience. The very desire to have an attentive audience makes the reader see the need for reading distinctly, loud enough for all to hear, and in a pleasing manner. The teacher does not find it necessary to urge these things because the situation enforces their need. After a reading has been given, the audience discusses the merits of the work and gives helpful suggestions for improvement. These suggestions are kept on catalogue cards which the pupil may see whenever he chooses. In this way from the very beginning, a history of the pupil's reading is kept. This record is valuable both to the teacher and to the pupil. The pupil finds in it statements of the good points in his reading and statements of his special deficiencies, followed by suggestions for overcoming these deficiencies. The teacher is able to judge fairly concerning the pupil's improvement from reading to reading and to know how much individual help

is required. Individual needs are handled individually, class needs collectively. A need for knowing how to use a dictionary was discovered to be a class need and exercises were given on how to find words quickly, how to use the guide to pronunciation, and how to select appropriate meanings. Other needs for the use of a dictionary were discovered in other studies. For example: In finding the derivation of subscription and superscription, the need for knowing where to find meanings of prefixes was felt; in geography, the problem of finding out why the terms A. M. and P. M. came to be used led to the appreciation of the need for knowing where to find meanings of abbreviations.

The reading begun in school is continued at home by reading to some member of the family. It was not long before the pupils discovered that simpler stories were needed to read to younger brothers and sisters. The matter was talked over by the group and it was decided to make sets of readers suitable for younger children. This at once furnished not only a motive for knowing how to read simple stories entertainingly, but also a motive for a project in industrial arts.

Books belonging to the teacher which contained collections of simple material were taken apart, and each story selected was rebound in pamphlet form. In a discussion as to how the different stories were to be found quickly, it was decided to letter the names of one set of readers on the covers, illuminate the capital letters of another set, and work out much more complex designs for the covers of the third. Pupils appreciated at once the need for learning good forms of letters and how to space and arrange them well, how to mix colors and use them effectively, and how to work out a design from the name of a story.

Lettering and designing was therefore made the subject of lessons in fine art. And, as many of the stories suggested to the pupils birds and animals as appropriate for their designs, a morning was spent sketching at the American Museum of Natural History. No urging of correct and careful work was necessary, for were we not all eager to get the best possible results in order that our covers please those to whom we read?

Two sets of readers are now completed. We have read from them to other grades in school, to younger brothers and sisters

at home, and at Christmas time a committee of pupils will choose representatives to send to the crippled children in Public School No. 27 at 42nd Street, in order to share some of the stories there.

To judge of the worth of this plan of reading, one has only to decide whether it is bringing the study into direct touch with the outside world and whether it leads the pupils themselves to appreciate the need for good reading.

Here in the making of the readers we find an example of a motive in one study furnishing motives in other studies and leading to a correlation of other studies. The planning of the readers became the subject of discussion in formal English; the binding of the books was done in the industrial art's period; the designing and lettering of the covers was worked out most enthusiastically in fine art.

The reading of "Rebecca of Sunnybrook Farm" led to an interest in the play. Advertisements, pictures of various scenes, and articles by Mrs. Kate Douglas Wiggin were brought in. A theatre party was formed to see the play and finally the pupils suggested we write to Mrs. Kate Douglas Wiggin telling her how much we were enjoying her book.

The writing of these letters gave a live purpose for English composition. The need for good form, careful and neat work and of writing letters not too long—for as one of the boys said, "Mrs. Wiggin might not have time to read long letters"—was felt by the class. Later, letters were written to Mr. Ernest Thompson Seton asking about the Boy Scouts in which organization the grade had become interested.

We very proudly exhibit to visitors "Our Diary" which contains letters written to us by both Mrs. Kate Douglas Wiggin and Mr. Ernest Thompson Seton. This diary kept by a different editor each week, contains also all the important and interesting happenings in the room. It will tell you about the industrial exhibits written for and the number obtained up to this time; will give the names of pupils who have brought in outside material for use in various studies; will explain how various groups make use of our reference shelf in the library; will tell of the Glee Club formed for the purpose of entertaining others; and how the planning and writing of history stories led to a dis-

covery of the need for knowing how to use a card catalogue in order that the bibliographies of the stories be complete.

Other illustrations of motive in our school studies might be given. However, the writer feels that here are a sufficient number to show the value of having back of every study *a live purpose.*

BERTHA M. GATH

CONSTRUCTIVE HISTORY STUDY IN THE EIGHTH GRADE

When school began this fall the pupils in the eighth grade had at the best but a "passive interest" in history and geography. In fact there seemed no enthusiasm for any study except literature and composition. How to get them to be really interested became the problem. One night while making from the text-book a list of the important events of the war of the Revolution, an inspiration came. Why not write our own histories and thus make use of the enthusiasm the children already felt for literature to help them become interested in history? We went to work at once.

The pupils were urged to read from all the available histories and then to select the events that struck them the most forcefully. We first listed the important causes of the war of the Revolution and then, by years, the big, significant battles, from which great issues seemed to come. The children read from the various histories at their command and then brought to class their reports as to what seemed to them important. We compared notes and gave reasons for our decisions. When we all agreed that an event was of real importance, each child wrote it up for himself. The first draft was handed in, corrected by the teacher, and then the matter was neatly copied into large note-books bound in boards. These note-books were illustrated by the use of Brown's pictures and maps. For instance, there were several pictures of the battles of Lexington and Concord, a picture of the Concord statue of the minute-man, another of the monument, bridge and minute-man at Concord, with a map of the New England states, on which the two towns were located.

When we came to the battles of Concord and Lexington, the pupils wrote letters describing the thrilling events of the night before, when Paul Revere took his great ride. Into the histories must go pictures of Paul Revere and of his home. So interested

were the children in this that then and there we commenced our diaries of the war of the Revolution. In these diaries we wrote anything that a boy or girl imagined would have been written had the writer been living in 1775. Readings from Hart's "Source Books" helped us to get into the spirit of the times. So well did the pupils achieve this that when our principal was reading extracts from some of the diaries she remarked to the teacher: "You or I would not be ashamed to be the author of one of these 'journals.'" Several extracts from two of these diaries follow:

April 18, 1775.

Much excited by troubles in and around Boston. Crops are sprouting. Built a scarecrow to keep away crows.

April 19.

Last night about one o'clock a man came galloping past yelling, "To arms! to arms! The British are coming!" My father and I hurriedly dressed and, taking our guns and all the ammunition at hand, started for the green. There we found many of our neighbors drawn up. We waited a while. Soon the red lines of the British appeared. The major, Pitcairn, ordered us to disperse. We did not. Then he ordered his men to fire. Eight of our men fell dead. Others were wounded. Then we were dispersed. The British went on to Concord where our supplies were stored. There they did little damage. On their return we fired on them from behind stones and fences. We killed and wounded about 300 British. We lost 102. I had my head skinned by a bullet. To-night many people have gone to Roxbury and Charleston, shutting the British in Boston.

May 6.

Worked until 5 o'clock to-day. When I reached home I found father reading a letter from an old friend in Vermont. He is one of the "Green Mountain Boys." He wants father to join an expedition to capture Ticonderoga, a fort containing supplies held by the British. Father started with some friends for Rutland to-night.

KENNETH DIKE

April 18, 1775.

War is certainly coming. We cannot stand things as they are much longer. The men and boys are restless, and the girls wish they might take part in the war.

I am writing with a tallow stub beside me. It gives little light. It is very late but I crept out of bed, when everything grew quiet, to write.

The British are in Boston and are probably waiting their chance to fire on us. They will be surprised at the volley they receive in return.

We are storing ammunition at towns along the way but the supply is so small in comparison with that of the British that ———

April 19, 1775.

I am so excited that I can hardly write. I might as well tell the story frontwards as backwards, so I will begin. I am anxious to reach the end. It is all so interesting.

Just as I reached "that" in my diary last night, I heard a great clatter and noise. I opened my window and listened. The noise grew more distinct. I heard the clatter of horses hoofs but above that ring clear and true the cry, "To arms, to arms! the British are coming!" Thrills ran through me. It seemed as tho' the time had come to fight at last. The sounds of the horse and horseman died away but other sounds rose on the air. The people in all of the houses were stirring. Men were getting their muskets and bidding their families good-bye. The boys took their muskets and, with proud looks, went away with their fathers. . . .

JEANNETE LEIDY

April 15, 1775.

Nothing happened until to-day when we heard that the last of the powder had been safely stored in Concord and that so far the British had not found out about it.

April 16.

Father went to town and heard the news that the British had discovered the powder and are gathering men to send to capture it soon.

April 19.

Last night Paul Revere came thro' the town calling and shouting and telling people that the British were coming. Every one jumped out of bed and dressed and every gun in the house was brought out and polished up. My father and two brothers, Jack and Harry, went off to Lexington early this morning. All the day long Mother and I have watched from the window for the return of the men. We were very much excited and then the neighbors came in and offered their opinions.

Long after dark we saw lanterns swinging down the road and heard the cheery talk of the men. We rushed out of the house and soon heard the glad news. We had beaten the well-trained Redcoats. How proud we were and Father was ready to fight two or three more battles and win them. My brother Jack had been badly wounded.

My father told the whole story from beginning to end, telling how they were drawn up in Lexington Green and the sixteen Americans were shot. The Americans chased the British all the way from Concord to a place near Boston where the Redcoats met reinforcements.

GRACE SEABROOK

The children were required to know about the first battle—Lexington and Concord; the invasion by Burgoyne and his allies; the surrender of Cornwallis at Yorktown. At the close of each chapter was added a bibliography of the books that the pupils had consulted and any others that were deemed to be of special value in connection with the subject.

The teacher of art helped us to design and letter the title-pages of our histories and, by a striking coincidence, nearly every pupil, working independently, selected a small picture of "the father of his country" for the title-page.

The composition work in connection with all of this has been unusually good and nearly all of the formal English lessons have been taken directly from errors in this work.

Now and then a debate was held on such subjects as: "Was John Hancock a traitor, as the English declared?" and "To what extent was Arnold blameworthy in betraying West Point?"

Very opportunely the battleships of the Atlantic fleet steamed into New York harbor and dropped anchor in the North River while we were studying about the exploits of John Paul Jones. Obtaining permission from the captain of the *Virginia*, the whole grade spent from three to six o'clock one afternoon on board the battleship. Two officers were detailed to take the pupils about and everything was carefully explained to them. The next afternoon the pupils entertained these officers at the school. The roof-garden was prettily decorated with flags and the class recited patriotic poems, sang national songs, and then invited the men down to the parlor where refreshments were served while sailors' yarns were spun to the great enjoyment of all.

The consideration of the war of the Revolution over, a study was made of the critical period, of conditions immediately succeeding it, and of the Articles of Confederation. Then came the great awakener of all—the Constitutional Convention. Here even the dull pupils became genuinely enthusiastic. Since we were really to have the convention, each one must take a part and do his share. As we had but twenty pupils in the class, some pupils must represent whole states, whose delegates took but little part in the discussions. The boy who took the part of Washington must study up especially on parliamentary rules.

Taking "Madison's Journal" as our main guide, and with John Fiske's "Critical Period of American History" and Eliot's "Debates" to help out, we began. As we must do the work in six weeks at the longest, we could take up only a few of the important discussions. Those in connection with the three great compromises were chosen: first, that the upper house of Congress be forever composed of an equal number of representatives from each of the states, and that the lower house be composed of delegates elected from the people of each state on the basis of population; second, that in counting population five slaves be counted as three white men; and third, that the importation of slaves be allowed for twenty years, or until 1808, and that Congress be allowed to control commerce except the taxing of exports, by a simple majority of votes.

The children have been very successful in changing from indirect to direct discourse, using the reports of the speeches in "Madison's Journal" and "The Critical Period," and so have had excellent practice in another phase of formal English. The great outline of the whole each child has had to construct for himself. There follows a short extract from a pupil's note-book:

On Friday, May 25, 1787, the delegates assembled.

Temple Franklin: The convention will come to order.

Robt. Morris: Mr. Chairman, by the instruction and in behalf of the deputation of Pennsylvania, I propose our late commander-in-chief, George Washington, Esquire, for president of this convention.

John Rutledge: Mr. Chairman, I second the nomination. I feel confident that the choice will be unanimous. The presence of General Washington prevents observations that might otherwise be proper.

Temple Franklin: It is moved and seconded that George Washington, Esquire, become the president of this convention. You will prepare your ballots for George Washington for president of the convention. Mr. Morris and Mr. Rutledge will act as tellers.

Ballots collected and counted.

Temple Franklin: I declare General Washington elected president of this convention. Mr. Morris and Mr. Rutledge will escort the president to the chair.

General Washington: Gentlemen, I thank you for the honor you have conferred upon me. I have never been in such a situation before or felt so embarrassed. This is a novel scene of business in which I am to act. I lament my want of better qualifications for the office and claim the indulgence of the House toward the involuntary errors which my inexperience may occasion. This convention is called to consider the revising of the Articles of Confederation in order to form a more perfect union and a more stable government. Every member of this convention should consider the great responsibility placed upon him.

Col. Hamilton: Mr. President, I nominate Maj. Jackson for Secretary.

Mr. Few: Mr. President, I second the nomination.

President: It is moved and seconded that Maj. Jackson become our secretary. You will prepare your ballots. Mr. Hamilton and Mr. Few will act as tellers.

In order that the pupils might realize that not all history is "ancient," that history is even now being made, three committees have been appointed and to them the pupils bring clippings from the newspapers and magazines concerning current events relating to (1) the city, (2) the state, (3) the nation and the world. These clippings are all mounted with their illustrations on sheets of gray drawing paper and a part of the work in industrial and fine art will be the binding of these sheets in board covers and the proper decorating and lettering of the covers. Index tables must also be prepared to make this material available for future use.

Florence V. Watkins

TEACHERS COLLEGE RECORD

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INTRODUCTION

By David Eugene Smith

The evolution of the teaching of primary arithmetic extends over a period of about two hundred years, although numerous sporadic efforts at teaching the science of number to young children had been made long before the founding of the Francke Institute at Halle. During the eighteenth century not much progress was made until there was established the Philanthropin at Dessau, and perhaps it would be more just to speak of primary arithmetic as having its real beginning in this institution at about the time that our country was establishing its independent existence. It is, however, to Pestalozzi, at the beginning of the nineteenth century, that we usually and rightly assign the first sympathetic movement in this direction, and it is the period from that time to the present that has seen the real evolution of the teaching of arithmetic to children in the first school years.

The evolution of this phase of education is one of the most interesting and profitable studies that a teacher of arithmetic can undertake. It reveals the experiments, many of them puerile but a few of them virile, that have been made from time to time; it brings into light the failures which should serve as warnings, and the successes which will inspire the teacher to better and more carefully considered effort; it shows the trend of primary instruction, and it makes the student of education

more sympathetic with the great problem before him. In particular, he will see the danger of narrowness in matters of method, the futility of expecting to create genuine interest by any single line of devices, the pitiful results that came from over-emphasis of the doctrine of formal discipline, and the errors of judgment that have been made in deciding upon what constitutes reality in an arithmetical problem for children. If by such a study he should see the childishness of confining one's self to the use of cubes alone, or of some special type of number chart, or of some particular form of number cards, or of sticks of varied lengths or shapes, the result would be salutary. If by his study of the absurd extreme to which formal discipline was carried a generation ago he is led to see the equal absurdity to which so many teachers are going to-day—the denying that any such discipline exists at all—his labor will bear good fruit in the school room of the present.

It fortunately happens that after this century of experiment we are getting about ready to take some account of stock; to weigh up values; to select from what the world has produced, and to select with some approach to good judgment. It is not probable that the time is entirely ripe for this labor, because we are at present in the midst of a period of agitation that seems certain to warp our judgment, the period of agitation for a somewhat narrow phase of industrial education, but even with this danger we are better able to weigh up the values in the teaching of arithmetic than we have ever been before. One reason for this is that we now have men and women of sufficiently sound education and sufficiently broad view to attack the problem. These men appreciate the efforts of Pestalozzi but they recognize that these are to the present what the science of Franklin is to that of Kelvin and Thompson. They appreciate what Tillich did for number work, and the influence of Grube, but they know that these men were narrow in view and dogmatic in statement, and that they stand rather as warnings than as founders of any worthy theory.

In looking for such a man to prepare a report upon the teaching of arithmetic in the primary grades, the American members of the International Commission on the Teaching of Mathematics turned first of all to Professor Suzzallo. They

felt that his standing as a scholar, his experience as a practical school man, and his position in the educational world fitted him perfectly for a work of this importance. That their good judgment did not fail them will be seen in reading the following report. In it Professor Suzzallo has set forth very clearly the aims of instruction in primary arithmetic, rightly considering these aims in their evolutionary rather than in their static aspects, emphasizing the importance of this phase of the study, and showing the present tendencies that seem making for a more rational view of teaching. He has discarded the narrow and trivial concept of method that characterized the educational work of a generation now passing away, and has brought dignity to the term by considering it from the modern scientific standpoint. He has discussed both historically and psychologically the important question of object teaching, showing the failures that have resulted from narrow views of the purpose of such an aid and the success that may be expected from a more rational use of number material. The whole question of the rôle of reason, or rather of the pupil's effort to express the rationalizing process, has been considered, the extreme danger points have been indicated, and the bearing of some of our saner forms of psychology upon the subject has been set forth. The technic of number, including the question of accuracy and speed in the operations, has also been treated in a very acceptable manner, Professor Suzzallo's experience in this phase of work having been unusual. And finally, the vexed question of what constitutes a genuinely concrete problem has been considered in its various bearings, and the present tendencies in problem making have been indicated. It is needless to say that the last word has not been spoken on this phase of the work, and that it never will be. New generations produce new lines of application of arithmetic, even for children. But with respect to the general principles of the selection of matter for the framing of problems Professor Suzzallo speaks with a conviction that will carry weight.

With all of the opinions expressed in such a report probably no reader will agree. It would be a poor discussion that would not provoke some opposition. But with the general tenor of the report it is certain that most thinking teach-

ers of to-day will find themselves in hearty accord. More important still is the fact that the report sets forth in clear language the present status of primary arithmetic in the more thoughtful educational circles in this country, and that it will state to teachers at home and abroad the tendencies as they now appear to the leaders of educational thought in the United States.

Teachers College, Columbia University,
February, 1911.

THE TEACHING OF PRIMARY ARITHMETIC*

A Critical Study of Recent Tendencies in Method

By Henry Suzzallo

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*Note: The material presented in this study was originally collected and organized for the purposes of a special report to a sub-committee of the International Commission on the Teaching of Mathematics. This commission was created at the International Congress of Mathematicians held in Rome in 1908, and is to report at the next Congress, to be held in England in 1912. The American members are Professors David Eugene Smith, W. F. Osgood and J. W. A. Young.

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CHAPTER I

THE SCOPE OF THE STUDY

It is the function of this study to convey some notion of the methods employed in teaching mathematics in the first six grades of the American elementary school. No attempt is made to give a minute description of the endless details of teaching procedure, nor even to enumerate all the types of teaching method employed. Its purpose is restricted to an analysis of the larger tendencies in teaching practice which are representative of the spirit of mathematical instruction in the lower schools.

Function of the Study to Trace General Tendencies

We should have a much simpler task if it were ours to sketch the purposes of mathematical instruction, or to outline the nature and organization of the various mathematical courses of study. As it is we have to describe something less concrete, namely the method employed in the presentation of mathematical subjects. Intimately dependent upon the subject matter involved, dominated by the special aims of mathematical instruction in a non-technical school, adjusted to the immaturities of childhood, and reflecting the personal habits of mind of the teacher,—teaching method emerges,—a powerful, variable, and subtle thing. In spite of subtlety and variability there are, however, certain general practices that can be described and analyzed. It is with these that this study will deal.

Teaching Method is a Mode of Presentation

Owing to the existing confusions, it is well at the very outset to have in mind a clear definition of the term "teaching methods." Teaching methods are always methods of presentation. In this respect the teaching art is like any other art, literary, graphic, plastic, or what not. The literary artist, for example, has a purpose, a subject matter, a particular audience,

and a special style of presentation. All these factors are present in the teaching art. The aims of instruction, the particular facts to be taught, the immaturity of the child taught, and the inevitable personality of the teacher determine the style of instruction, or, to use our own "trade word," a method of teaching. Every teacher, then, has a style or method—conscious or unconscious, good, bad, or indifferent. Unlike the literary artist, he has many ends to serve rather than one. His functions are general to life, and include moral, social, and personal ends, as well as those that are æsthetic. His methods of communication, too, are more than one. He presents his experiences objectively and graphically, as well as through the medium of written words and speech. Always the teacher's end is to stimulate growth through the presentation of experiences. When that presentation of experience takes a form and order different from that usual to adult life for the precise purpose of making the fact more readily comprehensible to the immature mind of the child, then that modification may be called a method of teaching. Teaching methods are always special manners of readjusting adult wisdom to the special psychological conditions of a student's mind.

Distinct Uniformities Exist Among its Variations

In the concrete, methods of teaching would always be specialized responses to situations, and as variable as situations are variable. Life is never just the same at any point. Yet certain essential similarities exist and give us the opportunity to interpret life in terms of law. The same may be said of the teaching life. In a sense it never repeats itself, yet to the degree that the same end, the same subject matter, and the same immaturity of mind recur in class rooms, teachers will tend to use similar modes of adjustment. In describing mathematical teaching in the primary schools, it is these similar modes of teaching adjustment, these similar "general methods," that we shall describe and analyze.

The Methods of Public Elementary Schools are Representative

It will be unnecessary to have a separate treatment of the "general methods" of mathematical teaching for public schools

and private schools. Whatever may be said of the state-supported schools will in general be true of private institutions. It is true of elementary schools as it is not of secondary and higher schools, that private institutions hold a relatively minor place, as compared with public or state schools. They are in a sense mere adjuncts to the public school system, claiming, in the generality of cases, no real difference in their ideals and methods of instruction. In the larger number of cases they draw their courses of study and methods from the public school systems of the immediate neighborhood. The social status of the parent or the personal incapacity of the child, rather than difference of school methods, is the cause of the special clientage of the private primary schools in the United States. Hence, a description of the characteristic methods of the public schools will be representative of the prevailing modes of instruction in American private elementary schools.

Elementary Mathematics is Mainly Arithmetic

Mathematical instruction in the first six years of the elementary school concerns itself almost exclusively with the teaching of arithmetic. A decade or so ago there was a vigorous movement for the introduction of algebra and geometry into the elementary school. These subjects made their appearance in the seventh and eight grades rather than in the first six school years. Where the influence of this movement penetrated the lower grades or persisted in the higher grades, the algebraic and geometric elements involved were so restricted and simplified that they became part and parcel of the subject of arithmetic, rather than the elementary phases of two more advanced subjects. Where the simple algebraic equation or the measurement of simple geometric figures has been introduced below the seventh year it has been as an arithmetical adjunct rather than as a novel field of mathematics.

Elementary Arithmetic Emphasizes the Four Fundamental Processes

By common practice, even the arithmetic taught in the primary grades has been given a restrictive emphasis. For the most part it is concerned with the mastery of the fundamental processes

in manipulating integers and fractions. The casual observer, in reading American courses of study, will note that in the lower grades the mathematical subjects taught are named after the abstract process involved rather than after the particular business institution to which the arithmetic is concretely applied. Thus in the lower grades, we teach counting, subtraction, fractions, decimals, percentage, etc.; while in the higher grades we teach interest, stocks and bonds, commission, insurance, etc. There is of course no hard and fast line of demarkation; one emphasis gradually passes over into the other, an approximate balance being maintained in the intermediate grades. It will perhaps simplify the task of this study and make its treatment more thoroughly representative of all conditions, if the general methods described be restricted to that field which is most characteristic of the first five or six years of mathematical instruction, namely, to the teaching of the fundamental processes of manipulating integers and fractions along with their simple applications to concrete problems.

The Need for Studying Exceptional Reform Tendencies

While the aspects of mathematical instruction here studied and presented are selected because of their representative nature, it would be unwise to restrict ourselves to a statement of the commonly accepted procedures of school-room practice. There are in America certain reform tendencies which are as characteristic of conditions as are the conservative practices. These modifying forces need to be mentioned along with the practices that they alter. Again, there are certain scientific efforts now well under way to study the problem of methods in teaching. While these have, as their immediate aim, the acquisition of new knowledge rather than direct educational reform, their ultimate effect will be to change methods of teaching. For this reason they are important, and have a proper place in this presentation.

CHAPTER II

THE INFLUENCE OF AIMS ON TEACHING

Factors Influencing Teaching Methods

It has been suggested that all teaching methods represent adjustments to several variable factors in the school-room situation. Teaching method is never, or should not be, just one thing. It is as variable as the factors that determine its situation. The purposes of mathematical instruction, the nature of the fact to be taught, the immaturity of the child, the teacher's scholarly equipment, his personality, his attitude toward the very idea or institution of method,—all these are influences in determining the status of mathematical teaching. Some of them are so important that it will be necessary to discuss them in detail at the very outset.

The Influence of a Scientific Aim

The purposes of mathematical instruction in the elementary school must always be very influential upon method. It makes a great difference whether one is merely teaching the elements of mathematics or is teaching mathematics as a tool for business life. It has not been long since the aim of mathematical teaching was merely scientific. The facts taught were the beginning of a science, and the end was to obtain a foundation for more advanced facts of the same kind which were dependent upon this foundation. As the teacher had learned his mathematics, so he taught the subject. To a considerable degree as the master's adult mind classified the facts of the subject, so he presented it to the child. His methods were logical rather than psychological. He gave the finished product or process to the child without special modification because the child was immature; a roundabout method that slowly approximated and only finally achieved the full result was with such a teacher exceptional.

Such a scientific aim, implicit rather than expressed, dominated the methods of teaching when arithmetic was handed over to the elementary schools by the higher institutions of education. As the first purpose to be rooted in the traditions of mathematical teaching it still persists with all the rigidity of a conservative force. Teachers still tend to teach future workmen in the lower schools as they themselves were taught by scientific scholars in the universities. And high school and college instructors still impose their standards upon the lower schools so as to influence their methods of instruction. As the purposes of higher instruction still remain largely scientific in purpose and method they give aid to the persistence of an original tradition in the elementary schools. Under such an influence, the worth of a mathematical fact is measured by its place in a logical scheme, rather than by its significance and recurrence in everyday life. The mathematician may need to know all about the names of the places in notation and numeration; the layman cares only about the accurate reading and writing of numbers, and not at all about the verbal title of "units of thousands" place. Again the rational needs of a student of mathematics may require an understanding of the reasons why we "carry" in column addition, but the effective everyday use demands an accurate *habit* of "carrying" rather than an accurate *explanation.* Yet just such methods persist in our schools because of the domination of a scientific treatment of the subject.

The Influence of the Aim of Formal Discipline

The remoteness of such mathematical teaching from the needs of common life, constantly threatens the loyalty and support of the public. Some defense becomes necessary on other than scientific grounds. Such a sanction could not be found in utilitarianism, for the waste was evident. It remained for a psychological theory to sketch a defense upon "disciplinary" grounds. The doctrine of "formal discipline" says that such mathematical teaching trains the powers of the mind so that any mastery gained in mathematics is a mastery operating in full elsewhere, regardless of the remoteness of the new situations from those in connection with which the power or ability was originally acquired. The facts and processes mastered might not be those

most needed in daily life, but they are good for every man inasmuch as they train his mind. Such was the dictum of the doctrine of "formal discipline."

The effect of such doctrine is to defend and perpetuate every obsolete, unimportant, and wasteful practice in the teaching of mathematics. No matter that partnership as taught in the schools had its original sanction in its close correspondence to the reality of business practice; no matter that the old sanction had passed: teach it now for its ability to discipline the mind! This questionable psychological doctrine said in consequence, "Whatever is, is right!" No matter that "life insurance" touches more men than "cube root"; the latter should be kept because of its power to train the mind. In life, where "approximation" of amounts suffices, the teacher demands absolute accuracy, and the ethical worth of such precise truth is the high law for its defense. In life "the butcher, the baker and the candlestick maker," figure out the total of a bill mainly "in their heads," with a few accessory pencil scribbles upon paper; the teacher finds sanction in æsthetics for requiring a complete statement written or re-written in exquisite form. Regardless of the truth that is concealed in the doctrine of "formal discipline," it must be confessed by those who know the history of teaching method in the United States that it is the main defense of conservatism and the largest cause of waste in teaching methods.

The Shift in Emphasis from Academic to Social Aims

Such has been the ground upon which recent educational reform has operated. Slowly the older scientific and disciplinary aims of instruction have given way to the newer purposes of business utility and social insight. In that step a large transition was covered. Before, the school had measured the worth of its work by standards internal to educational institutions. The schoolmaster and the scholar, rather than the man on the street, had formulated the scientific classifications of mathematics and expounded the doctrine of "formal discipline." Hereafter the measure of efficient school instruction is a reference to standards external to the school, the product of conditions outside of school life. Business need and social situation determine if

a fact or process is worth comprehending, and whether the method of instruction has been effective.

Business Utility as an End

The utilitarianism that first attacked the older course of study and its methods was the utility of the business world. The arithmetic of business life became the standard. The practices of the market determined what matter, skill, and accuracy should be demanded of the elementary school pupil. And recently it had become the habit to call upon the business man to give his opinion as to what constitutes good arithmetical training; and no criticism was so feared as that of the business leader who says that the boys that come to him are incompetent. Committees on courses of study have even investigated the relative frequency and importance of specific arithmetical processes in the business world with the idea of utilizing the results as a basis for changes in the mathematical curriculum.

This aim of business utility, coming at a time when the elementary school course was felt to be overcrowded, met with a ready reception. It operated for the time being as the standard by which materials and methods in arithmetic are to be eliminated, if not actually selected. Materials, not general to the business world, such as the table of Troy weight, were therefore eliminated. Processes of computing interest infrequently used were supplemented by more widespread and up-to-date methods. More doing and less explaining characterized the instruction in adding columns of figures, and such manipulation mimicked the exact conditions of its use in the world at large. If strings of figures are usually added in vertical columns in the business world, then they should be taught in vertical columns more nearly exclusively than before. The obsolete and the relatively infrequent, the over-complex and the wasteful processes of the old arithmetic tended to disappear. More than any other influence, this aim of business utility has combatted the over-conservative influence of scientific and disciplinary aims which dominated previous decades. The newer methods of teaching have kept the best of the old movements. The work is still scientific in that it is accurate; it is still disciplinary in that it trains; but the

truth and the training which are given are selected by and associated with actual business situations common to everyday life.

Broad Social Utilitarianism as a Standard

There is evidence in the present thought of teachers that a broader utility than that of the business world is beginning to obtain in the schools. The general increase in the social consciousness of the teacher is reflected in mathematical instruction. Everywhere in these days the American teacher and the educational writer speak of the social aims of education. More than ever before the social consciousness of the teacher enlarges. In spite of an increasing movement toward specific vocational training, as seen in the industrial education movement, for example, there has been a reactionary defense of the elementary schools as an institution for very general training in the things which are socially fundamental and common. This movement toward the preservation of the elementary school as a place for giving a broadly socialized and modern culture, is not only checking the inroads of a narrow vocational education, but it is broadening the conception of the older studies, of which arithmetic is but one. Arithmetic is not a subject in which only the skills of calculation are cultivated; it is one that contributes social insight, just as history and geography do.

The influence of the social aim of instruction upon mathematical instruction is subtle but obvious. The business man's opinion with reference to arithmetical instruction is not always taken as gospel. There are other standards. "Why," says the schoolmaster, "should I train people for your special needs, any more than for the demands of other trades that men ply? To be sure our graduates do not fit perfectly into your shop at once. But that precise and local adjustment is the work of the business course or of shop apprenticeship. My function is to train men for the situations common to all men and special to no class. The elementary school is a school for general culture or social appreciation, not a business college or a trade school." The sociologist usurps the place of the business man as the school's proper critic.

Some Concrete Effects of the Change in Aims

The immediate effect is that arithmetical applications find a larger place in teaching. A saner relation is established between abstract examples and concrete problems. And the problems, in increasing extent, are real problems, true to life, if not actual. No more does arithmetic, in the best schools, confine itself to figures alone. Figures are applied in concrete problems. There may be days of teaching when not a figure is used during the arithmetical period. The social setting, the business institution, which calls for the calculation, is studied as carefully as the process of calculation. The students are given a knowledge of banking as well as a skill in the computation of interest. They may even visit a bank, a factory, a shop, as the case may require. Instead of having fifteen problems which will deal with fifteen different subjects all more or less remote from each other, as was universally the case with most older textbooks and teaching methods, the class hour may be given over to fifteen problems related to one situation, as a bakery shop or an apartment house. Thus arithmetic gradually gains a social setting and unity.

The situation to-day as influenced by existing aims is one of transition in which old and new purposes mingle with unequal force in giving us a mixed process of instructing American youth in arithmetic. Old materials and methods still persist, for logical and disciplinary ideals still hold; but the newer regimen ushered in by the demands of business utility and social understanding gains ground. The obsolete, the untrue, the wasteful methods pass from arithmetic teaching, and the pressing, modern, and useful activities and understandings enter. Arithmetic is less abstract and formal as a subject than it was; it has become increasingly vital and concrete with real interests, insights, and situations. The grind of sheer mechanical drill decreases in teaching, and a reasoned understanding of relations, in some degree at least, is substituted. Artificial motives and incentives are less frequently used to get work done, and the appeal of live institutions for a quantitive solution and understanding increasingly asserts itself.

CHAPTER III

THE EFFECT OF THE CHANGING STATUS OF TEACHING METHOD

Method as a Psychological Adjustment to the Child

At the very beginning, it was suggested that many factors enter into the nature of our teaching methods. There was occasion to show the influence of varying aims on the spirit and manner of instruction, for differing aims inevitably amend any presentation of facts, in school or out. While factors of fundamental influence, they are scarcely the most characteristic elements in the modes of presentation employed in the school room. It is the attempt to adjust methods of presentation to the psychological conditions of childhood which is most significant for the institution of teaching method. Teaching method in the school is primarily a readjustment of forms of knowledge and experience so as more effectively to stimulate and improve the immature responses of children. The growing importance of "method" in educational theory marks a growth in the teacher's consciousness of psychological factors precisely as the appearance of the newer aims in teaching has marked an increased regard for social factors.

The Effect of an Increased Reverence for Childhood

Two important movements have been responsible for the development of special methods of teaching during the past few decades,—one is humanitarian and the other scientific. On the one hand, there has been a growth in reverence and sympathy for childhood. As yet it has scarcely expressed itself with fullness. Its presence is revealed by the widespread enactment of laws designed to guarantee the rights of childhood,—laws against child labor and in favor of compulsory education. The growth of special courts for juvenile offenders, the development of playgrounds, and the decreased brutality of discipline at home

and school, are other symptoms of the public attitude toward childhood. The wide acceptance of the "doctrine of interest" in teaching; the enrichment of the curriculum; specialized schools for truants and defectives; individual instruction,—these are the schoolmaster's recognition of the modern attitude toward childhood. Under such conditions teaching becomes less and less a ruthless external imposition of adult views, and more a means of sympathetic ministry to those inner needs of child life which make for desirable qualities of character. While it is true that teaching method is a condescension to childhood, it is a socially profitable condescension in that it is a guarantee of more effective and enduring mastery of the life that is revealed at school. Since the child's acquisition tends the more to be part and parcel of his own life under such sympathetic teaching, the products of such instruction are enduring.

The Reconstruction of Method through Psychology

Such a humanitarian movement naturally called for knowledge of the child. The wisdom of common sense soon exhausts itself, and more scientific data are demanded. Thus the "child study movement" came into existence. Frequently cataloguing the obvious rather than classifying new and hitherto unexplained data, the movement was in some degree disappointing. But one thing it did; it focused attention upon the child as the crucial factor in education, the prime conditioning force in all methods of instruction. Since then, a saner psychological foundation has been laid for educational procedure, one which is criticising and reconstructing teaching method at every turn. Hitherto teaching methods had been improved fitfully through a crude empiricism. As the ablest teachers became dissatisfied with their teaching and dared to vary their methods, they selected the successful, and other teachers willingly adopted the methods that seemed better than their own. Now a body of general psychological knowledge, rich in its criticism of old methods and in its suggestion of new means of procedure, gives a scientific basis to teaching method. Already, where special psychological knowledge is needed, the educational psychologists seek it through investigation. And where the counter claims of competing methods defy ordinary psychological analysis and inves-

tigation, the comparative student of teaching methods begins his experimental teaching under controlled but natural conditions.

The Increased Professional Respectability of Conscious Method

Increased sympathy with childhood and increased scientific knowledge of human nature together give teaching method a new justification. The result is that the era of complete dependence upon teaching genius and mere common sense in methods of instruction has passed out of the American elementary school. We are now in a period where a specific professional technique in teaching is demanded, a technique partly developed out of crude personal and professional experience, and partly founded upon scientific criticism and experiment. A new humanitarian and scientific attitude toward the mental life of children elevates teaching method to a position it has never before enjoyed.

The public elementary-school teacher is conservative indeed who will deny that there is anything worthy in the notion of "method." As a class, teachers have faith in the special professional technique which is included under the term. They are critical of the many abuses which have been committed in the name of method. Method cannot be a substitute for scholarship. It cannot be a "cut and dried" procedure indiscriminately or uniformly applied to class-room instruction. Like every other technical means, teaching method is subject to its own limitations and strengths, a fact which the average teacher recognizes.

The Prevalence of Methods Emphasizing a Single Idea

In spite of the fact that the majority of elementary teachers keep reasonably sane on the problem of method in teaching, it must be admitted that a considerable proportion of teachers are inclined to be attracted by systems of method that greatly overemphasize a single element of procedure. The hold which the "Grube method," with its unnatural logical thoroughness and progression, gained in this country two or three decades ago is scarcely explicable to-day. Scarcely less baffling is the very large appeal made by a series of text-books which lays the stress upon the acquisition of arithmetic through the idea of ratio and

by means of measuring. Manual work as the source of arithmetical experiences is another special emphasis, which, like the others, has had its enthusiastic adherents. Again it is "arithmetic without a pencil" or some other over-extension of a legitimate local method into a "panacea" or "cure-all," which confronts us. The promulgation and acceptance of such unversatile and one-sided systems of teaching method are indicative of two defects in the professional equipment of teachers: (1) the lack of a clear, scientific notion as to the nature and function of teaching method, and (2) the lack of psychological insight into the varied nature of class-room situations. Untrained teachers we still have among us, and others, too, to whom a little knowledge is a dangerous thing. These are frequently carried away by the enthusiastic appeals of the reformer with a system far too simple to meet the complex needs of human nature. Our experiences seem to have sobered us somewhat, the increase of supervision has made responsible officers cautious, and increased professional intelligence has put a wholesome damper upon naïve and futile proposals to make teaching easy.

The Tendency Toward Over-Uniformity in Method

A more serious evil than that just mentioned is the tendency of the supervising staff to over-prescribe specific methods for class-room teachers. Recently there has developed, more particularly in large city systems, a tendency to demand a uniform mode of teaching the same school subject throughout the city. This has been brought about by the prevalent tendencies of large school systems to centralize their authority and demand uniformity of procedure. The prime causes of this tendency are to be found (1) in the specialization of grade teaching, and the consequent interdependence of one teacher on another; and (2) in the mobility of the school population which involves considerable lost energy if teachers do not operate along similar lines.

The result of such imposed uniformity is a reduction of spontaneity in teaching. The process of instruction proceeds in a more or less mechanical fashion, the teacher working for bulk results by a persistent and general application of the methods laid down. That teaching, which at every moment tends to adjust itself skillfully to the changes of human doubt and interest,

difficulty and success, discouragement and insight, now taking care of a whole group at once, now aiding an individual straggler, now resolutely following a prescribed lead, now pursuing a line of least resistance previously unsuspected, cannot thrive under such conditions. It stifles teaching as a fine art, and makes of it a mechanical business. Under these conditions only those activities which fit the machine routine can go on. Thus it happens that we memorize, cram, drill, and review, and soon the subtler processes of thinking and evaluating, which are the best fruit of education, cease to exist.

Method as a Series of Varied Particular Adjustments

Fortunately the one-method system of teaching will soon belong to the past, and the imposition of uniform methods is beginning to lose ground even in our cities. For the most part, the common sense of teachers and the positive statements of our better theorists keep teaching methods in a sane and useful status. Teaching methods should be infinitely variable as the conditions calling for their use are endlessly changeable. Not one method but many are necessary, for methods are supplementary rather than competitive. No one method should be used with a pre-established rigidity; each must be flexible in its uses, so as to accomplish the varied work to be done. The teacher directly facing the intellectual and emotional crises of childhood is the best interpreter of conditions and the best chooser of the tools of workmanship. The supervisor may advise and may point out certain fundamental laws of growth and procedure; but the concrete method which is the application of these must be of the teacher's making.

Arithmetical teaching, like the instruction in other subjects, has suffered from these widespread ventures of teaching method. In this respect it has shared the common professional lot. But in addition it has had special difficulties and adventures of its own. We have now to note those special phases of teaching method which are peculiar and local to mathematical instruction.

CHAPTER IV

METHOD AS AFFECTED BY THE DISTRIBUTION AND ARRANGEMENT OF ARITHMETICAL WORK

The Tendency Toward Shortening the Time Distribution

Several decades ago arithmetic, as a formal subject, was begun in the first school year and continued throughout the grades to the last school year. This is no longer a characteristic condition, much less a uniform one. There have been forces operating to complete the subject of arithmetic prior to the eighth year, and to delay its first systematic presentation in the primary grades for a period varying from six months to two years. The report of the "Committee of Fifteen" of the National Education Association summarizes the tendency existing in 1895 when it states: "That with the right methods, and a wise use of time in preparing the arithmetic lesson in and out of school, five years are sufficient for the study of mere arithmetic—the five years beginning with the second school year and ending with the close of the sixth year."

The Attempt to Eliminate Waste

The attempt to shorten the period of formal instruction in arithmetic has had its effects upon the methods of teaching as well as upon the arrangement of the course of study. The presence of a large number of children who leave school by the seventh year, the example of a varied European practice, the overcrowded curriculum,—all these have combined to suggest a shortened treatment of arithmetic. Hence economy, through the elimination of obsolete and unimportant topics in the course of study and through better methods of instruction, has become a pressing matter. Its influence on method is obvious.

It has focused attention upon "teaching method" and given it an increasing importance in the eyes of mathematical teachers. Specifically, it has tended to reduce the amount of objective

work, to eliminate the explanation or rationalization of processes which in life are done automatically; it has made teachers satisfied with teaching one manner of solution where before two or three were given; it has laid the emphasis upon utilizing old knowledge in new places, rather than on acquiring new means.

Delay in Beginning Formal Arithmetical Teaching

The tendency toward delay in beginning formal arithmetical instruction is to be explained in terms of several causes. Under a regimen, where complicated and obsolete problems, difficult of comprehension, were common in elementary school tests, it is natural that teachers should grow to believe that arithmetic is too difficult a subject for young children and that better results could be obtained if the subject were not commenced till the children were more mature.

This belief persists even after the curriculum is purged of all obsolete and over-complex materials, and has become a modern course of study with materials well within the comprehension and interest of primary children.

The Incidental Method of Teaching

The by-product of this belief is that any arithmetic taught during these first few years should be taught "incidentally," as a chance accompaniment of their other studies. Only after one or two years of incidental work should the formal arithmetic instruction be given. This "incidental" method of teaching beginners is difficult to estimate. It has been so variously treated that a comparative measure of its worth is difficult to obtain. The contention that children who are taught incidentally for two years and systematically for two years more have at the end of four years of school life as good a command of arithmetic as those who have had a systematic course through four school years, is difficult to substantiate or deny on scientific grounds. Sometimes "incidental" teaching required by the course of study becomes "systematic" in the hands of the teacher. Sometimes the two years of "systematic" teaching which follow the incidental teaching mean far more than two years, since the teachers, in order to catch up, give more time and emphasis to the subject than the relative time-allotment of

any general schedule would seem to warrant. Such have been the facts frequently revealed by a class-room inspection that penetrates beyond the course of study, the time schedule and the regulations of the school board.

Reactions against the Plan of Incidental Teaching

In the lack of specific comparative measures of the worth of such methods of instruction, there is a growing conviction (1) that beginning school children are mature enough for the systematic study of all the arithmetic that the modern course of study would assign to these grades; (2) that considering the quantity and quality of their experiences they can think or reason quite as well as memorize; and (3) that what the school requires of the child can be better done in a responsible, systematic manner than by any haphazard system of "incidental" instruction.

These reactionary attitudes by no means imply a return to "systematic" teaching of arithmetic in the first two school years, nor to such formal methods as had previously been employed. Other grounds forbid. The crude, uninteresting memoriter methods of the past have gone for good. Objective work, plays, games, manual activities make arithmetical study easier and more efficient. Indeed, these newer methods have been a large factor in convincing teachers that children have the ability to master the first steps in arithmetic during the first two years. Regardless of this change in professional belief, it is a fairly general opinion that arithmetic should not be thrown upon the school-beginner along with the other heavy burden of learning to read. Learning the mechanics of reading is quite the most important part of the first school year, and the addition of the difficulties of another language, for such number is, would be to overburden and distract the child. Hence a common sense distribution of burdens and tasks, regardless of questions of child maturity, would delay the formal and systematic study of arithmetic a half or whole school year, little reliance being placed upon previous "incidental" acquisitions.

Logical and Psychological Types of Arrangement

There are other problems of method that are not so much concerned with the beginning of the study of arithmetic, or

with the span of school life that the subject is supposed to cover. These deal with the arrangement of sub-topics within the course of study, or with the manner of progression from one aspect of arithmetical experience to another. I refer now to the various methods of planning the work in arithmetic from grade to grade, of which the "Grube method" and the "spiral" methods are types.

The methods that have been employed in the United States for the arrangement or ordering of topics within the course of study have varied considerably from time to time, but all these variations may be grouped around two types: (1) The "logical" types of arrangement, and (2) the "psychological" types of arrangement. If the course of study proceeds primarily by units that are characteristic of the mathematics of a mature adult mind, the type may be said to be "logical." If the course of study proceeds primarily by units that are characteristic of the manner in which an immature child's mind approaches the subject, then the type may be said to be "psychological." The dominant arrangements have been "logical" up to within a couple of decades. The older text-books taught "notation and numeration" rather thoroughly, then proceeded to a fairly adequate mastery of "addition," then to "subtraction," and so on. Such an arrangement is distinctly "logical." So also was the later "Grube method" which progressed by numbers rather than by processes.

The courses of study, which have been most familiar to us in the past decade, have used the "concentric circle" or "spiral" methods of arranging the sub-topics of arithmetic. These arrangements are "psychological" in type. They are attempts to give a systematic order of mastery which shall approximate the child's order of need in knowing. Here the first mathematical facts and skills taught are those the child first requires, regardless as to whether they are integers or fractions, additions or divisions. A little later, he deals with the same subjects and the same numbers in more complicated manipulation and in more extended application. The field is re-covered, as it were, by ever widening circles or by an enlarged swing of the "spiral" progression.

Estimates of Worth

The older "logical" plans are thorough and definite in their demands; the teacher always knows just what he is about. But such a system of procedure is unnatural and remote from the child; it lacks appeal and motive. The child pursues the subject as a task laid down for him, not as an answer to his own curiosities or necessities. The newer psychological plans meet the different levels of child-maturity effectively; they are nearer the natural order of acquiring knowledge. But it is not easy for the teachers to keep account of the work of their own, previous, or subsequent grades. Nor does the supervising official find it easy to locate responsibility for definite arithmetical subtopics. As an order of teaching it is psychologically natural but administratively ineffective.

The Present Mixed Method of Procedure

The result is that, to-day, the two types of arrangement are modifying each other and giving a mixed method, partly "logical" and partly "psychological." That line of least resistance in which the children study arithmetical facts and processes with greatest success is modified by definite demands that topics,—*e. g.*, addition,—be mastered thoroughly "then and there." The method is partly "topical" and partly "spiral." The child in the second grade may have a little of all the fundamental processes, a few simple fractions, and U. S. money; but just there he will be held definitely responsible for a very considerable number of the addition combinations. The pupil may have had fractions in every grade, but the fifth grade will be responsible for a thorough and systematic mastery of the same. Such is the mixed method of arrangement which is to-day prevalent in American schools.

CHAPTER V

THE DISTRIBUTION OF OBJECTIVE WORK

Object Teaching is Generally Current

The use of objects in teaching arithmetic is current in the elementary school. Particularly is this true in the lowest grades of the school, in primary work. It may be said that there is a very large quantity of objective teaching in the first year of schooling and that it decreases more or less gradually as the higher grades are approached. By the time the highest grammar grades are reached the use of objects has reached its minimum.

The teaching of arithmetic prior to the middle of the nineteenth century was little associated with object teaching. That is to say, the general practice of instruction was non-objective. The use of objects in giving a concrete basis for abstract arithmetical concepts and for memoriter manipulations, seems to have gained its initial hold on the schools through the introduction of Pestalozzian methods of teaching. The later introduction of school subjects requiring objective treatment, such as elementary science, nature study, and manual training, fortified the previous movement and gave it considerable enlargement. Together these two movements established the respectability of objective teaching in arithmetic. School-room experience quickly gave it an empirical sanction. It remained for the modern psychological movement in education to give it a scientific sanction, and to refine its uses.

The Crudity of its Distribution

It is quite fair to say that the use of objective work decreases more or less gradually from the first to the last year, the underlying assumption being that the use of objects has a teaching value that decreases as the maturity of the pupils increases. Current practice does not proceed far beyond the application

of the simple and somewhat crude psychological statement that the youngest children must have much objective teaching, the older less, the oldest least of all. The lack of a more refined analysis of the worth of object teaching necessarily leads to some neglect and waste.

If a topic occurs late in the course of study, as in the case of square root, the subject is not so well taught because of the current prejudice or tradition against the use of object-teaching in the higher grades. On the other hand it is also probable that the teaching of addition is often accompanied by wasted time and energy simply because lingering over objects in the lower classes is the current fashion.

Tendency Toward a More Refined Correlation of Object-Teaching with Particular Immaturity

Reform in the direction of a more refined and exact use of object teaching has already suggested itself in the treatment of fractions and mensuration, where, regardless of the increased maturity of the children studying these topics, a large amount of objective method is utilized. This is a considerable departure from the slight objective treatment of other arithmetical topics taught in the same grades. Such exceptional practices suggest that the novelty of an arithmetical topic is the condition calling for objective work in instruction. It is immaturity in a special subject or situation which determines the amount of basal objective work. The correlation is not with the age of the pupil, but with his experience with the special problem or subject in hand. It is of course true that the less experienced the student is, the greater the likelihood that any subject presented will be novel and strange. Only in this indirect manner, does the novelty of subject matter coincide with mere youth as an essential principle in determining the need of objective presentation. The naïve assumption of the older enthusiastic reformers that objective work is a good thing psychologically, one of which the pupil cannot have too much, is by no means the accepted view of the new reformer. With the latter, objective presentation is an excellent method at a given stage of immaturity in the special topic involved, but it may be uneconomical, even an obstacle to efficiency, if pushed beyond.

The Movement Supported by Both Scientific and Common-Sense Criticism

There is, then, a certain coincidence of the scientific criticism of the psychologist and of the common-sense criticism of the conservative teacher who look suspiciously upon a highly extended object-teaching. The teacher, on grounds of experience, says that too much objective teaching is confusing and delays teaching. The psychological critic says it is unnecessary and wasteful. The result is that, in these later days, the distribution of objective work has changed somewhat. More subjects are developed in the higher grades through an objective instruction than before. Perhaps no fewer subjects in the lower grades are presented objectively, but the extent of objective treatment of each of these has undergone considerable curtailment.

CHAPTER VI

THE MATERIALS OF OBJECTIVE TEACHING

The Indiscriminate Use of Objects

The existing defects in objective teaching are not restricted to a false placing or distribution. The quality of the teaching use of objects is likewise open to serious criticism. Object teaching is a device, so successful, as against prior non-objective teaching, that it has come to be a standard of instruction as well as a means. As long as objects—any convenient objects—are used, the teaching is regarded as good. Given such a sanction, the inevitable result is an undiscriminating use of objects. The process of objectifying tends not to be regulated by the needs of the child's thinking life; it is determined by the enthusiasm of the teacher and the materials convenient for school use.

The Artificiality of Materials Utilized

The first fact which is noted in observing objective teaching is the artificiality of the materials employed. Primary children count, add, etc., with things they will never be concerned with in life. Lentils, sticks, tablets and the like are the stock objective stuff of the schools, and to a considerable degree this will always be the case. Cheap and convenient material suitable for individual manipulation on the top of a school desk is not plentiful. But instances where better and more normal material has been used are frequent enough in the best schools to warrant the belief that more could be done in this direction in the average class room. The "playing at store," the use of actual applications of the tables of weight and measures are cases that might be cited.

Narrowness in the Range of Materials

The materials used are not only more artificial than they need be, they are too restricted in range. As has already been said,

the types of material capable of convenient and efficient use in a school room are not numerous. But the series can and ought to be extended. More forms of even the artificial material should be used, thus minimizing the danger of monotony. The blame for the narrow range of materials used falls partly on school boards who do not vote a sufficient allowance for teaching materials to primary teachers; partly on teachers who do not exercise sufficient ingenuity in devising new forms of objects or show the vigor requisite to a shift from one material to another; and partly on the supervisory staff which has neither been insistent upon nor sensitive to the need of a more interesting range of objective stuffs.

Inadequate Variation of Traditional Materials

Even the narrow range of materials in general use might be better employed than it is. There is of course a distinct tendency to vary the objects, merely because a child gets tired of it as a material. But a different quality of variation is required when the pupil is to derive abstract notions from concrete materials. It is too frequently the case that the teacher will treat the fundamental addition combinations with one set of objects, *e. g.,* lentils. In all the child's objective experience within that field there are two persistent associations—" lentils " and " the relation of addition." The accidental element is thus emphasized as frequently as the essential one, and being concrete has even a better chance to impress itself. A wide variation in the objective material used would make teaching more effective, particularly with young children.

The Restricted Use of Diagrams and Pictures

The nature of the materials proper to objective teaching has likewise been too narrowly interpreted. Objective teaching has meant, almost exclusively, instructing or developing through three-dimensional presentations. There is a wide range of two-dimensional representations which have been neglected, but which for all the psychological purposes of education have as much worth as so-called objects. I refer here to the use of such material as pictures. Such quasi-objective material has been little used by teachers save as it appears in text-books. Even the

text-book writers have not used pictures with a deep sense of their intrinsic worth. They are printed as a mere substitute for objects in a period when objects are popular pedagogical materials. The geometric figure or diagram has had a restricted use with both the teacher and the text-book writer. Its most frequent use has been in treatments of mensuration. There are, of course, obvious disadvantages to pictures and diagrams. The things represented in and by them are not capable of personal manipulation by the child in the ordinary sense. But they have a superiority all their own. They offer a wider, more natural, and more interesting range of concrete experiences.

Plays and Games in Object Teaching

There are other curious phases of narrowness in the current pedagogical interpretation as to what constitutes a concrete or objective experience. It will be noted that visual objects are the ones generally employed and that they are generally inanimate objects. Of late there has been some tendency to use hearing and touch in giving a concrete basis to teaching. Advantage is taken of the social plays of children, and their games with things. Here the children themselves, and their relations and acts are the experiences from which the numerical units are obtained. With some of the best teachers in the lowest grades it is no longer unusual to see children moving about in all sorts of play designed to add reality to and increase interest in number facts.

The Lack of Unity in the Use of Objects

The conservative teacher's use of objects is hopelessly artificial and lacking in unity. If he brings a series of objects into the development of a single topic, they have little relation to each other, and they represent no actual grouping. Their sole connection with one another is that they exemplify the same abstract arithmetical truth. Beans, cardboard squares, and shoe-pegs may all be employed in the same lesson. The progressive teachers offer more logical unity in their materials. To "play at store," to utilize games, to deal with things within a

picture, is to bring the concrete materials into the class room with a more nearly normal setting. It is in no small measure due to this better use of material that the progressive teacher is gaining power throughout the elementary grades.

CHAPTER VII

SOME RECENT INFLUENCES ON OBJECTIVE TEACHING

It has already been suggested that there has been considerable waste in the use of objective teaching in the lowest grades; and that the recent tendency has aimed to correct it. The sheer enthusiasm of the reformer is partly responsible for this. When did single-minded men ever keep within bounds? The defense in our social economy lies in the fact that other single-minded men are conservatives. Men at one extreme need to be overcome by like men at the other extreme. There are, however, other contributory causes which have made it easy to go to unfortunate extremes.

The Influence of Inductive Teaching

Inductive teaching has been one of several movements affecting objective teaching. The effort of teachers to escape the slavishness of mere memoriter methods and to approximate real thinking led to the introduction of inductive teaching. Necessarily objective teaching became more or less identified with the new movement and was influenced by it. So, it has been said of objective work in arithmetic, as it has been said of laboratory work in the sciences, that such instruction is a method of "discovery" or "rediscovery." Such an alliance has had its beneficial effects upon objective teaching; it has redeemed it from the aimless "observational work" of an earlier "objective study." But in the teaching of arithmetic, at any rate, it confused an objective mode of presentation with a scientific method of learning truth, two activities having a common logical basis, but not at all the same. Under the assumption that the "development" method is one of "rediscovery," the tendency is to give the child as complete a range of concrete evidences as would be necessary on the part of the scientist in substantiating a new fact. The result is, that long after the child is convinced of

the truth, say that 4 and 2 are 6, the teacher persists in giving further objective illustrations of the fact. The child loses interest in the somewhat monotonous continuance of objective manipulations, and the teacher has naturally wasted time and energy. If the fact or the process that the teacher wishes to convey can be transmitted with fewer objective treatments (the authoritative treatment of the teacher counting for something in school as authority counts everywhere), then it is unnecessary to exhaust the objective treatments of a numerical fact. Inductive teaching and learning are not equivalent to inductive discovery; and to hold them identical is necessarily to overdo the use of objects in teaching.

The Movement for Active Modes of Learning

Another modern movement in teaching method which has had a conspicuous effect on objective teaching is the movement toward " self-activity " on the part of the child. The recent favor enjoyed by manual training, nature study, self-government, and other active phases of school life is an index of the general movement in mind. Its influence has not only forced the introduction of new subjects; it has changed the manner of presenting the older subjects of the elementary curriculum. Arithmetic has responded along with the other subjects and an active use of objects by the children themselves is found in increased degree.

There was a time when objective work in the schools was a passive matter so far as the child was concerned. Any active manipulation of the objects that might be required was cared for by the teacher, the child being merely a passive observer. This is at present much less the case than formerly, the influence of " self-activity " having entered with contemporaneous pedagogy. The present situation is one where the child sometimes merely observes objects and sometimes actually handles them.

At present then we have about the same range of methods employed in teaching arithmetic as in teaching science. At one extreme the teacher himself demonstrates by the help of objects in the presence of the class, and records the relations in appropriate arithmetical symbols, the class being in the position of interested spectators of a process. At the other extreme the

teacher puts the material on the desks of the children and, with a minimum of instruction in advance, directs them toward the desired experiences and conclusions.

The Abbreviated Use of Objects

As might be expected, there has been some reaction against the influences emerging from inductive or developmental teaching and active modes of learning. The presence of such reaction in the school situation leaves the teaching practices in mathematical instruction more diverse than ever. To a considerable degree, however, the reactionary influence expresses itself in the abbreviated use of objects in presenting a mathematical relation, process, or manipulation. One mode of abbreviation will suffice as an example.

There are two methods of relating the symbols and processes of arithmetic to the actual relations between objects. For convenience these may be called the methods of "parallel correspondence" and of "final correspondence."

The Method of Parallel Correspondence

The method of "parallel correspondence" is generally used in the development of all the simpler combinations or processes of arithmetic. In learning to count, the child sees the first object and says the symbolic "one," sees the second object, and says the symbolic "two." Again in addition, he sees "ten," and writes the symbol 10; sees "six" and writes 6; sees the whole as sixteen, and writes 16; then summarizes the work in the form $10+6=16$. Each stage in the symbolic process is noted in connection with objects. This, the method of "parallel correspondence," is the more current method of using objects.

The Method of Final Correspondence

The method of showing a "final correspondence" of result between objective manipulation and symbolic manipulation is much less frequently used. It is used with more complex processes than those mentioned above, in connection with column addition or "borrowing" in subtraction. It is a mode of object teaching used in place of the usual "explanation" or "rationalization" which attempts to explain what is simply a correspondence between the manipulation of a series of facts and the

manipulation of a series of symbols. Under this method the teacher usually tells the child directly how to perform the process in the conventional manner, no special explanation being given. Then a case involving the actual use of objects is considered and this result is compared with the result obtained by the symbolic manipulation. One or two such cases suffice to convince the pupil that the authoritative mode is true to nature. This method of "final correspondence" in the use of objects represents a new and restricted, but increasing tendency.

CHAPTER VIII

THE USE OF METHODS OF RATIONALIZATION

The Tendency Toward Rational Methods

Some of the marked changes which have occurred in the methods employed for the presentation of number to children have already been mentioned in connection with the objective teaching of arithmetic. The main tendency to be noted is that objective instruction increasingly ceases to be a mere device of illustration, and becomes the first step in inductive or developmental teaching. It is subsumed under a more inclusive method. The change is significant for it is a symptom indicating that mathematical teaching is becoming less dominantly memoriter and more rational.

The Era of Direct Instruction and Drill

Several decades ago it was not at all unusual for the bare facts of arithmetic to be given to the child by the teacher without much attempt at providing a basis in the pupil's own experience. The teaching was "direct," the teacher's attention being focused on getting the fact from his own mind into the child's mind, the whole emphasis being placed upon the problem of transmission and the subsequent difficulty of retention. In so far as objects and illustrations were used, they were merely incidental and reinforcive. They did not constitute any basic body of personal experience by which the child was to seize a concept, relation, or process to be handled thereafter through symbols and conventional forms. Under such a system of instruction, still too widely prevalent, the child had to memorize outright, without any concrete basis for his belief, tables of addition, multiplication, etc., and the rules for solving various types of problems. It was outright memorization for which but little motive was provided. In insuring retention the teacher therefore relied, not upon interested and varied impressions, but

upon the number of verbal repetitions. "Drill" was characteristic of this era in teaching.

Indirect Teaching as a Rational Method

Under the influence of the inductive or developmental method of teaching, the emphasis on the repetitional memorization of number facts and processes is reduced. Teaching now becomes "indirect" rather than "direct"; the child learns through his own experience rather than through the statement of book or teacher. Here the child's own thought and activity, not the teacher's, are conspicuously central in the teaching situation. The teacher stimulates the child into action; he suggests, guides, corrects, does everything in fact save obtrude his authority and opinion into the child's interpretation of his own experiences. The child's activity, his self-direction, gives him many vivid and varied impressions of the subtraction combination or other relation. When he has *found* the fact he has already learned it! Further drill or review is not primary, but simply supplementary,—a further guarantee of the persistence of the impression. Even the spirit of such supplementary drill and review is, in these days, something different from a monotonous repetition of the same words; it is a reimpression or review of the essential fact in many varied and interesting forms.

Interest as a Factor in Methods of Rationalization

It is perfectly natural that, in shifting the teacher's attention from his own activities to those of the children, the interest of the child should be considered in increasing degree. If the child is to learn directly, with a maximum use of his initiative, it is absolutely essential that the teacher should provide some motive. This implies that the child is to be interested in some fundamental way in the activities in which he is to engage. Instead of thumbing the fundamental facts with his memory, in an artificial and effortful manner, "sing-songing" the tables rhythmically, so as to make dull business less dull, the teacher begins at once to use the child's own life as the basis for instruction. The number story, the arithmetical game, playing at adult activities, constructive work, measuring, and other vital interests of the child and community life become increasingly

the basis of instruction in number. Such is the pronounced tendency wherever the movement is away from the traditional rote-learning or drill.

Of course there is a slight tendency in American elementary schools, where a soft and false interpretation of the "doctrine of interest" is gospel, to teach only those things which can be taught in an interesting fashion. But this tendency is less operative in arithmetic than in other subjects. Here the logical interdependence of one arithmetical skill on another has quickly pointed the failure of such a haphazard mode of instruction.

The Reaction against Rationalization

There is, however, in "advanced," as well as in reactionary quarters, a revolt against the tendency to objectify, explain, or rationalize everything taught in arithmetic. On the whole it is a discriminating movement, for this opposition to "rationalization" in arithmetical teaching, and in favor of "memorization" or "habituation," bases its plea on rational grounds, mainly derived from the facts of modern psychology.

It is specifically opposed to explaining why "carrying" in addition, and "borrowing" in subtraction are right modes of procedure. These acts are to be taught as memory or habit, inasmuch as they are to be performed by that method forever after. To develop such processes rationally or to demand a reason for the procedure once it is acquired, is merely to stir up unnecessary trouble, trouble unprompted by any demands of actual efficiency.

Four Principles for the Use of Rationalization

A study of the actual arithmetical facts upon which this opposition expresses itself suggests the four following general principles as to the use of "rationalization" and "habituation" as methods of mastery: (1) Any fact or process which always recurs in an identical manner, and occurs with sufficient frequency to be remembered, ought not to be "rationalized" for the pupil,—but "habituated." The correct placing of partial products in the multiplication of two numbers of two or more figures is a specific case. (2) If a process does recur in the same manner, but is so little used in after life that any formal

method of solution would be forgotten, then the teacher should "rationalize" it. The process of finding the square root of a number illustrates this series of facts. (3) If the process always does occur in the same manner, but with the frequency of its recurrence in doubt, the teacher should both "habituate" and "rationalize." The division of a fraction by a fraction is frequently taught both "mechanically" and "by thinking it out." (4) When a process or relation is likely to be expressed in a variable form, then the child must be taught to think through the relations involved, and should not be permitted to treat it mechanically through a mere act of habit or memory. All applied examples are to be dealt with in this manner, for such problems are of many types, and no two problems of the same type are ever quite alike. These laws will, of course, not be interpreted to mean that no reason is to be given a child in a process like "carrying" in addition. The reason is not essential to efficient mastery, but it may be given to add interest or to satisfy the specially curious.

The Substantiating Psychology

The theoretic basis which seems to underlie such a statement of general principles as to the use of the two methods mentioned is derived from functional psychology. Memory and reasoning are not separate functions; they are interdependent; but we mean differently by these terms because they have distinguishable emphases. It may be said that memory as a function is efficient only in the face of familiar situations where, if the association is present at all, the response is quick and precise. In the face of new situations it is incapable of accurate response. Reason is slow and uneconomical in action but it is the only efficient method of arriving at the essential nature of a problem largely unfamiliar. It would be wasteful to meet many of the necessary events of life with a purely reasoned reaction. It would be too devious and deliberate in reaching conclusions.

Rationalization as a Substitute for Object Teaching

There is a sense in which all proof through objects is a type of rationalization, but we do not ordinarily so consider it. Such

a mere " correspondence with the objective facts " is sufficiently different from the method of " explaining a new fact in terms of previously acquired facts " as to warrant a separate classification. Were it not that the methods are sometimes interchangeable in developing arithmetical truths, they would not need to be mentioned here. A citation will make the point clear. In teaching the multiplication tables, the combination " six twos are twelve " may be taught as a direct objective fact, as when six pupils with two hands each are shown. On the other hand the same fact of multiplication may be taught as a " derived fact," as when six twos are added in a column and make twelve. They are both rational methods of proving that six twos are twelve. One method shows it objectively, the other through the use of well established addition combinations viewed as multiplication. Such a rational mode of " deriving " multiplication is used more frequently perhaps than the objective method.

CHAPTER IX

SPECIAL METHODS FOR OBTAINING ACCURACY, INDEPENDENCE AND SPEED

Supervision of Learning after First Development

It is not alone the first stages in the acquisition of an arithmetical process which have received attention in the re-organization of teaching methods, though, to be sure, the problem of first presentations has in recent decades been given the most attention. More and more, the American tendency is to watch every step in the learning process, to provide for all necessary transitions, and to safeguard against avoidable confusions. It might be suggested that the intermediation of the teacher at every step in the child's work might destroy the pupils initiative and independence. Apparently, however, those who are deeply interested that the child should not be permitted to fall into the errors which unsupervised drill would convert into habits, are fully as cautious to provide steps for forcing the child to assume an increasing responsibility for his own work. The distinction made is that an over-early independence is as fatal to accurate and rapid mathematical work as an over-delayed dependence.

The Use of Steps or Stages in Teaching

Some of these serial treatments or related stages of method to which reference has been made may be cited. Necessarily only the more important are mentioned. In indicating certain clean-cut steps or processes, there is no intent to convey the idea that these stages are fixed or conscious matters. The statement is merely indicative of the habitual tendency of the average practitioner with an implied theory. As will be readily evident there is no assumption that such a formal, classified, theoretic statement of stages is a conscious possession of the teaching staff in general. Again, in actual school work there are many types of variation from the characteristic modes here

suggested. Always the steps overlap; frequently they are extended, abbreviated or omitted. But the statement represents, in a very real way, the trend of underlying theory, whether conscious or merely implied.

Stages in the Presentation of Problems

One of the specific controversies much argued in the primary school concerns the medium through which arithmetical examples and problems shall be transmitted to young children. There are three typical ways in which a situation demanding arithmetical solution may be brought to the child's mind: (1) The situation when visible may be presented through itself, that is, objectively. (2) The situation may be described through the medium of spoken language, the teacher usually giving the dictation. (3) The situation may be conveyed through written language, as when the child reads from blackboard or text. Inasmuch as objects are a universal language, no difficulty arises through this basic method of presentation. It is when a language description of a situation is substituted for the situation itself that difficulty arises. The child might be able to solve the problem if he really understood the situation the language was meant to convey. Owing to the difficulty that primary children have in getting the thought out of language, it has been urged that problems in any unfamiliar field should be presented in the following order: (1) Objectively or graphically; (2) when the fundamental idea is grasped, through spoken language; and (3), after the type of situation is fairly familiar, through written or printed language. It is seriously urged by some teachers that no written presentation should be used in the first four grades. Such an extreme tendency would practically abolish the use of primary text-books. There are many exceptional teachers who do not put a primary text in the hands of children at all. Such a tendency is increasing. Particularly is this true among primary teachers in the schools of the foreign quarters of large cities. Accurate communication through the English language is always more difficult here. Hence, the period of objective teaching is necessarily prolonged, dependence

on the "number stories" told by the teacher increased, and the solution of written problems much longer delayed than elsewhere.

An Opposite Method in Presenting Examples

The situation is somewhat different, almost the opposite in fact, when "examples" rather than "problems" are presented, meaning by "example" a "problem" expressed through the use of mathematical signs. It is easier to present "examples" in written form on blackboard or in text than it is to dictate them orally. This obviates the necessity of holding the examples in mind during solution. The permanence of the visual presentation saves the re-statement frequently necessary in oral presentation. Hence it is a common practice to supply the youngest children with mimeographed or written sheets of "examples." It is with older children or with younger children at a later stage in the mastery of a typical difficulty, that oral presentation of examples is stressed. Then we have that type of work which is called "mental" or "silent" arithmetic.

Better Transitions from Concrete to Abstract Work

There is some tendency toward the provision of better transitions from the objective presentation of applied problems to the symbolic presentation of abstract examples. Behind all uses of objective work is the belief that it is a mere foundation for more rapid and efficient abstract work. Objective teaching is fundamental, but purely preparatory. The child ought to pass from objects and sense-impressions, through images of various degrees of abbreviation, to symbols and the abstract concepts for which they stand. But in American practice a sharp jump is usually made from concrete objects to abstract symbols. The transition through adequate transitional imagery is not made. Wherever psychological influences are directly at work in the schools there is a minority movement favoring a better transition. The nature of such a transition is scarcely reasoned out as so much psychological science, but is the accompaniment of a widening professional movement for the enlarged use of pictures, diagrams, number stories, and the like. A critical examination of the various means of presenting arithmetical

situations would order them as follows in making the transition from objective concreteness to symbolic abstractions: (1) Objects, (2) pictures, (3) graphs, (4) the concrete imagery of words, (5) more abstract verbal presentations, (6) presentations through mathematical symbols. No such minuteness of adjustment is apparent in existing methods, though it might seem desirable in teaching young children. At any rate, it would be more effective than an unreasoned traditional procedure full of over-emphasis and omission.

The Child's Four Modes of Work

We have thus far discussed merely the teacher's activity in instruction. We have to note the graded requirement made in the child's own activity. What is the existing custom with reference to the manner in which children are required to solve the problems or examples presented to them? There are four typical ways in which the child does his work, the names of which are derived from the differentiating element: (1) The "silent" method, otherwise spoken of as "mental arithmetic," "arithmetic without a pencil," etc. (2) The "oral" method where the child works aloud, that is, expresses his procedure step by step in speech. (3) The "written" method where the child writes out in full his analysis and calculations. (4) The "mixed" method where the child uses all three of the previously mentioned methods, in alternation, as necessary for ease and efficiency.

The Worth of These Modes

The worth of these four methods of work is necessarily variable. The rapidity of the "silent method" with simple figures is obvious. The "silent method" and the "mixed method" (which is more slow but more manageable with complex processes and calculations) are the two methods normally employed in social and business life. The purely "oral" and "written" methods, with their tendency toward analysis and calculation fully expressed in oral or written language, are highly artificial. They are valuable as school devices for revealing the action of the child's mind to the teacher so that it may be corrected, guided, and generally controlled. The present ten-

dency is toward an over-use of these methods and toward an under-use of the other two, more particularly the "mixed" method. It would seem that there is little conscious attempt to make certain that the child moves from full oral or written statement to the judicious application of the more natural "silent" and "mixed" methods. It may be that full oral and written statements of work have seriously hampered the right use of the more natural methods of statement.

The Traditional Quarrel Between "Mental" and Written Arithmetic

One conspicuous traditional quarrel in the schools is between the "silent" and the "written" methods. Up to within a decade or so ago, "silent" or "mental" arithmetic was much over-emphasized, being carried to absurd extremes. The reaction that followed was equally extreme in its emphasis on the "written" method. There are signs now of a more rational use of the two as supplements of each other.

The order in which different statements of arithmetical work should come has also been a subject for pedagogical argument. The usual order, due to the fact that first treatments of a topic are simple both in the steps of reasoning and the calculations involved, has been "silent" arithmetic followed by "written" arithmetic. A more recent order has been: (1) "silent" (2) "written" (3) "silent"—a much superior serial order, though by no means an accurate statement of a perfect procedure. The fixed treatments necessitated by text-books have made teaching method arbitrary in its steps, here as elsewhere. It is altogether probable that many simple calculations or analyses can be done "silently" ("mentally") from the beginning; that others require visual demonstration, but once mastered can thereafter be done without visual aid; that still others will always have to be performed, partially at least, with some written work. It is purely a matter for concrete judgment in each special case, but the existing practice scarcely recognizes this truth. The result is that many problems are arbitrarily done in one way, and it is too frequently the uneconomical and inefficient way that is used.

The Transition from Development by Teacher to Independent Work by Pupil

It is well to recall that in all these efforts to control the child's activity, there is a tendency to leave the child over-dependent upon the teacher. It is vitally important that a child should be kept free of any error which unsupervised drill would fix into the stubbornness of habit; but it is likewise important that the child should acquire some self-reliance. While not always clearly defined, there is a distinct tendency in the direction of releasing the teacher's control of the child. A characteristic practice would be one in which the teacher's work with the child would pass through various stages, each one of which would mark a decrease in the control of the process by the teacher and an increase in the freedom of the child to do his example, or problem, by himself.

Four Characteristic Stages of the Transition

One characteristic series of stages quite frequently used in the presentation of a single topic in arithmetic, say "carrying" in addition, is the following: (1) The teacher performs the process on the blackboard in the presence of the class, the children not being allowed to attempt the process by themselves until after the process is clearly understood from the teacher's development. (2) The children are then allowed to perform the process upon the blackboard, where it is exceedingly easy for the teacher to keep the work of every child under his eye. An error is caught by a quick glance at the board and immediately corrected before the child can reiterate a false impression. (3) Other cases of the same type of example are assigned to the children at their seats where they work upon paper, still under the supervision of the teacher,—a supervision which is less adequate, however. (4) The same difficulty, after the careful safeguarding of the previous stages, is then assigned for "home work," where the child relies almost completely upon himself. Once more it is necessary to suggest that these stages are merely roughly implied in the variations of existing practice.

Special Methods of Attaining Speed

Most of the methods discussed in this chapter have had as their sanction the attainment of accuracy in thinking and calculating. Some efforts to insure independent power on the part of the child have already been noted. But nothing has been said of the effort to add speed to accuracy in getting efficient results. Such special efforts have been made. These efforts may be classified into two groups: (1) Those aiming to quicken the rate of mental response. (2) Those aiming at short-cut processes of calculation.

Typical of the first are (a) the use of an established rhythm as the child attacks a column of additions; (b) the device of having children race for quick answers, having them raise their hands or stand when they have gotten the answer; (c) the assignment of a series of problems for written work under the pressure of a restricted time allotment for the performance of each. These and similar devices are much used in the schools. They are open to the objection that they quicken the rate of the better students, but foster confusion, error, and discouragement among the less able children, and frequently actually retard speed.

The various shorter methods which represent the effort to reduce the number of mental processes required are usually not of general applicability, and consequently have not attained any general currency in the elementary schools where the object is to teach one generally available and effective method even though it requires more time, special expertness being left to later development in the special school or business which requires it.

The Relation of Accuracy to Speed

It has come to be quite a common recognition of teachers that the fundamental element in rapid arithmetical work is certain and accurate work. If pupils know their tables of combinations and are sure of each detail of calculation, there is no confusion or hesitancy; speed then follows as a matter of course. This belief, as much as anything else, explains why the lower schools have developed few special means for attaining speed apart from those already mentioned.

CHAPTER X

THE USE OF SPECIAL ALGORISMS, ORAL FORMS, AND WRITTEN ARRANGEMENTS

The methods of teaching arithmetic are influenced not only by the aims of such instruction, but by the peculiar nature of the matter taught. The use of special algorisms, temporary algoristic aids or teaching "crutches," oral and written forms of analysis are of considerable moment in determining the difficulties and therefore the methods of teaching. Their condition and influence will need to be given some slight notice.

The Traditional Nature of Algorisms and Forms

The algorisms and forms used in the American schools are those that have been determined by social and educational traditions. It is probable that wide social practice has largely determined the traditions though it must be admitted that the traditions of text-book makers have also given it form. In consequence the ruling school tradition in the matter of algorisms does not always coincide with current community practice. It is probable that the various modes of computing interest, given by the average arithmetic of ten years ago, were once current in the business world. These methods have changed somewhat, and the school form of computation has not always been changed to accord. Such misadjustments between the forms used in school and those used in daily life are not numerous, but they are more frequent than they ought to be.

The Number of Algorisms Used

The use of various algorisms for a single process is not very frequent. There is a fairly general prevalence of a single algorism for a single process among American teachers. Certain striking exceptions are to be noted in connection with subtraction and division, where the so-called "Austrian" methods are

being brought into competition with the traditional modes of the American school. It may be said, however, that even when two distinct algorisms are in contemporaneous use in a school system, the teachers are usually careful to employ only one algorism with a given child. Even when a child moves from a school using one kind of algorism to a school using another, the tendency is to allow him to follow his own method.

Reform in the Use of Algorisms

The tendency toward the substitution, duplication, and modification of existing algorisms is inconsiderable, and very recent. The introduction of the "Austrian" algorisms, already mentioned, is perhaps the most conspicuous movement having a very wide group of adherents. There are, however, a group of teachers and educational psychologists who are attempting to refine teaching methods so as to attain a greater economy and efficiency in the learning process. These are responsible for a movement toward the reform of existing algorisms. The movement expresses itself in a number of ways,—it offers new forms, modifies others, and aims to bring a larger similarity and consistency into algorisms employed in the various stages of the same process. Its function is always to simplify for the child and thus to increase the practical efficiency and the mental economy of his methods.

The Standard of Social Usage

One of the standards set, is, that as far as is consistent with economy, the algorism employed with greatest frequency in social life is to be preferred. If people add, subtract and multiply with their figures $\left(\begin{smallmatrix}6\\3\\9\end{smallmatrix}\right)$ arranged above and below each other in vertical form, then the vertical form is to be preferred to the horizontal method $(6+3=9)$ so largely used and imposed by text-book writers.

The Extended Use of Acquired Forms

To learn two forms for one thing, particularly when one has no sanction either in current use or on general grounds of psychological efficiency, is a waste. Hence there is an increasing disposition both in general practice and among the more criti-

cal to utilize a single form in as many places as possible. "Subtracting by adding" is merely using the same association and word form for both addition and subtraction. Hence only one set of tables, instead of two, has to be learned. The meaning, the applicability, and the visual form of addition and subtraction are still different. Only the process of remembering and using the fundamental combinations is the same. But this is a large saving: "Dividing by multiplying" is an analogous situation, though not as much employed in American schools as "subtracting by adding." The most radical suggestion for utilizing a simplified common form is one in which these forms of division, as used in the tables ($18 \div 6 = 3$), short division (6)1832), and long division (62)$\overline{18325}$( ) are reduced to one consistent form in all three cases, as 6 | 18, 6 | 1832, 62 | 18325. Such a simplification is urged in other situations. The movement has not passed far beyond theoretic acceptance, though several city school systems are trying the experiment, San Francisco being a notable instance.

The Use of "Crutches" or Temporary Algorisms

The use of special and temporary algoristic aids or learning "crutches" in mathematical calculation is one of the problems of method under constant controversy. Teachers seem fairly evenly divided upon the question. Typical situations in which such "crutches" are used may be noted as follows: Changing the figures of the upper number in "borrowing" in subtraction; rewriting figures in adding and subtracting fractions. In the broad sense any algorism which is used during the teaching or learning process temporarily, to be abandoned completely later, is an "accessory algorism" or "crutch." The objections to their use lie in the fact: (1) that skill in manipulation is learned in connection with stages and forms not characteristic of final practical use; (2) that this implies, psychologically at any rate, the waste of learning two forms or usages instead of one; and, (3) that it decreases the speed with which mathematical calculation is done. If there is a drift in any direction, it is probably toward the abandonment of "crutches."

Full and Short Forms of Calculation

The division of opinion, which exists in connection with the temporary use of special algorisms or "crutches," likewise exists with reference to the use of "full forms" and "short forms" of manipulation and statement. The temporary use of a "full form," in a case where a "short form" will finally be used, is similar to the employment of a "crutch." There is one important difference, however, which explains the relatively larger presence of temporary "full forms," than of "crutches." The "full form" is an accurate form which is used somewhere,—in a more complex stage of the same process or in some other process; the "crutch" is not. Thus: a "full form" in column addition with partial totals and a final total of partial totals, will be utilized in column multiplication, the "long division form" of doing "short division" (that is the fully expressed form of dividing by a number of one figure) will be utilized in division by numbers of more than one figure.

Forms of Analysis or Reasoning

The problem of form applies not alone to the algorism or special method of computation, but it likewise applies to the special methods of reasoning used in determining the specific series of steps to be taken in achieving the answer. In every problem the child solves, he must not only decide *what is to be done* (reason), but he must *do it* (calculate). There are forms of reasoning as there are forms of calculation. As any calculation may have several algorisms the solution of a problem may be expressed in several forms. It is the latter difficulty which appears in the teacher's demands for "formal analysis" of problems. The analysis is usually required in full statement.

The Traditional Requirement of Full Formal Analysis

The tendency to carry the child through the full oral or written statement of the reasoning and calculation involved has been a very general requirement in American schools. Formal statements have been demanded of the child as much on the side of reasoning as on that of calculation. One of the causes of this demand is found in the tendency of the teacher to encourage full statement by the child, merely as a revelation of his inner

processes so that the source of error in results might be detected and the error eliminated. We have already noted this predisposition of the teacher to call for full oral and written statements for purposes of control in the various methods designed to achieve and safeguard accuracy.

The Limitations of Full Formal Analysis

There is, however, a marked tendency away from formal analysis of arithmetic problems in the elementary school, just as there is a movement away from a formal deductive logic in the higher schools. The interest in natural, genetic modes of thought is supplementing the unnatural, formal statement of steps. Here again the radical tendency is the outcome of critical analysis. It is felt that while such full formal statements of reasoning and calculation may assist in the teacher's control, they may actually interfere with accuracy and rapidity on the child's part.

To write out each step in full often means giving an enlarged attention to factors that are merely touched and assumed in actual thinking. To delay the thought process, with attention held on a fully developed linguistic statement, whether oral or written, may be to distract from the chain of essential ideas or meanings that really solve the problem. Frequently children lose the thread of thought midway of the process because of the necessity of dealing with the form side, and have to begin anew.

"Labeling" the Steps of Calculation

A conservative protest against the old formal expression of reasoned steps is found in omitting for the most part the linguistic statements dealing with the logic of the problem and merely "labeling" the numbers that occur in the calculation. This is a more restricted form of statement, much more used at the present time than hitherto. But it is still open to psychological objections that make the more scientific critics protest. There are many stages in a calculation where there is no association whatever with the concrete problem in hand. The concrete problem is studied, the decision is made that all the factors named are to be added. They are added, purely abstractly, and a number is given as the total. The result is then

thought of in terms of the concrete problem in hand. A disposition to label each item in the addition may be necessary in the rendering of a bill, but it is a false and obstructing activity in the actual solving of the problem. The same situation exists where there are two or three processes to be utilized in series. Once the child has grasped his concrete situation and reasoned what to do—he may proceed to mechanical manipulation, never thinking of the concrete applications till he is done.

So-called Accuracies of Statement

The protest mentioned above even goes so far as to attack the teacher's insistence upon certain so-called accuracies of statements. The case of 3 pencils at 5 cents would be expressed 3 times 5 cents = 15 cents. $3 \times 5 = 15$ would be demanded, and 5×3 not allowed at all. The protest is not against insistence on a proper order where "labeled" statements are used. The objection is made against the demand for the so-called proper order when abstract figures are related merely by signs. Where the child calculates symbolically, he sees the situation as one to be worked out by a purely conventional relation between two numbers. For all practical purposes 5×3 will solve the situation quite as accurately as 3×5. The insistence on one, as opposed to the other, is a useless effort that cannot affect the result.

Increased Use of Mathematical Symbols

The same tendency which is making for a reduction of verbal forms is increasing the use of mathematical symbols. As logical relations are less frequently written out, a simple sign such as + or ÷ is used. The algebraic x is supplied in place of a whole roundabout series of awkward preliminary statements or assumptions. With it, of course, come changed methods of manipulation, as in the use of the algebraic equation.

It is doubtless true that the rigidity of full logical forms is giving way to a more flexible and natural mode of expressing the child's thoughts. Fixed oral and written forms of exposition may assist the child, much as the acquisition of a definite symbol fixes an abstract meaning, which remains unwieldy until

it attaches itself to a word by which it is to be recalled. But increasing care is manifested that children shall use only those forms that will conform to practical need upon the one hand, and to natural, efficient, and economical mastery on the other.

CHAPTER XI

EXAMPLES AND PROBLEMS

Formal and Applied Arithmetic

The teaching of arithmetic is usually classified under two aspects, formal work and applied work. The formal work deals mainly with the memorization of fundamental facts, processes and other details of manipulation. The applied work, as the name implies, is the formal work utilized in the setting of a concrete situation demanding a solution. These two aspects of arithmetical instruction are very frequently sharply separated, the child working alternately with one or the other. The characteristic practice is to deal with them without relating them as closely as the highest efficiency would demand.

The Example and the Problem

Formal exercises in arithmetic are usually presented through the "example"; the exercises in application through the "problem"; the distinction being that one is an abstract and symbolical statement of numerical facts and the other a concrete and descriptive statement.[1] In the first case the mathematical sign tells the child *what* to do, whether to add, subtract, multiply, or divide; the example being a kind of prereasoned problem, the child has only to manipulate according to the sign, his whole attention throughout being focused on the formal calculation. In the second case the child has two distinct functions; he must, from the description of the situation presented, decide, through the process of reasoning, *what* he is to do (add, subtract, divide or multiply), and having rendered his judgment, he must proceed through the formal calculation.

[1] *Note:* While this distinction is not general, it has sufficient currency to warrant its use here for the convenience of discussion. The expression "clothed problem" (from the German) is occasionally used to mean what is here designated as "problem," and "abstract problem" is used to mean what is here designated as "example."

The Traditional Precedence of Formal Work

As the problem involves two types of mental processes in a single exercise, and the example but one, the usual procedure in arithmetic is to take up the formal side through examples first and, later on, the applied side through the use of problems. This means that the first emphasis is on formal and abstract work rather than on a treatment of natural, concrete situations, an emphasis not wholly sanctioned by modern psychology and the better teaching procedure of other subjects.

Objective and Narrative Presentations as a Reform Tendency

The reform tendency is found mainly in the primary grades where the beginnings of new processes are made through objective presentations of the problem. But the transition from objectified problems to formal work is not immediate. The children pass from objectified situations to "number stories," which are only descriptions or narratives of a situation. This is the interesting primary-school equivalent of that more businesslike language description found in the higher grades, the arithmetical problem. But it precedes formal work and succeeds it,—the formal drill being a mere intermediate drill. Here concrete presentations and formal work are more closely related and more naturally ordered.

This reform tendency, which began in the primary school, is extending to the higher grades, where it is no longer rare to find the attack upon a process preceded by careful studies of the concrete circumstances in which the process is utilized. In the case of interest, several days might be utilized in studying the institution of banking in all its more important facts and relations. Such an approach not only provides motive for the formal and mechanical work, but it gives a necessary logical basis in facts. Hence the understanding of practical business life makes accurate reasoning possible for the child when he is called upon to solve actual problems in application of the formal work.

The Over-Emphasis of Formal Work

It is perfectly natural under the general traditional practice of putting the first emphasis on mastery of the formal work

that the largest amount of attention should be given to the mechanical and technical side of arithmetic, and that the concrete uses and applications should be slighted, and this is generally true of the practice of American teachers. Much more ingenuity has been used in the careful training of the child on the formal side than in teaching him to think out his problems. There is no such careful arranging and ordering of types in teaching a child to reason, as there is in teaching him to colculate.

The Need for More Systematic Teaching of Reasoning

Here and there a few thoroughly systematic attempts are made to carry the pupil through the simple types of one-step reasoning, to two-step and three-step problems with their possible variations. Just as the example isolates the difficulties of calculation, by letting the sign of + or — stand for the logic of the situation, there is a tendency to give problems without requiring the calculations. This affords a means of isolating and treating the special difficulties of reasoning. The child is merely required to tell what he would do, without doing it; the answer being checked by the gross facts. A little later, as a transition, he is permitted to give a rapid, rough approximation of what the answer is likely to be. With further command he tells what he would do and does it *accurately*. But such a program of teaching is still rare among teachers.

Existing Devices for Testing Reasoning

The care of the child's reasoning is largely restricted to testing his comprehension of the problem, (1) by having him restate the problem to be sure he understands it, or (2) by having him give a formal oral or written analysis of the way in which he solved the problem. The first requirement may not be thoroughgoing, as the child may give a verbal repetition of the problem without really knowing its meaning. The second is a formal analysis of the finished result and does not represent the genetic method of the child's thinking. Consequently its formulas do not, in any considerable degree, assist him in his actual struggle with the complex of facts.

Sources of Failure in the Solution of Problems

This lack of a systematic teaching of the technique of reasoning is manifest in the unreliability of children's thinking. When a child fails in a problem assigned from the text-book, the source of the error may be in one or more of three phases: (1) In failing to get the meaning of the language used to describe the details of the situation; (2) in failing to reason out *what* needs to be done to solve the situation; (3) in failing to make an accurate calculation. The first is a matter of language; the second, one of reasoning; the third, one of memorization. The elimination of errors, due to the first and third sources, leaves a considerable proportion to be accounted for by the second. Such informal investigations as have been made seem to show that the children who fail in reasoning do not make any real effort to penetrate into the essential relations of the situation. They depend on their association of processes with specific words of relation used in the description of the problem, an association determined of course by their past experiences. As long as these familiar "cue" words are used, they succeed. Let unfamiliar words or phrases be utilized in their stead or let the relation be implied, and, like as not, the children will fail to do the right thing. Practical school people are familiar with the fact that children solve the problems given in the language of their own teachers and fail when the problems are set by principals or superintendents, whose language is strange to them.

The Need of Varied Presentations of Problems

A greater use of varied objects in the objective presentation of problems, and a more constantly varied use of language in the descriptive presentation of problems would prevent the child making such superficial and unthoughtful associations, and force him to think out connections between what is essential in a typical problem and the appropriate process of manipulating it. But such a deliberate application of modern psychology is far from being a conspicuous minority movement. The subject matter of the problems given to children has, however, improved

greatly. Obsolete, puzzling, and unreal situations which only hinder the child's attempt to reason are less and less used in problem work.

Improvement in the Subject Matter of Problems

Daily it becomes recognized with greater clearness that right reasoning depends upon a comprehension of the facts of the case, and the facts of the case in point must be within the experience of the child. This is the only way in which a problem can be real and concrete to him.

Real and Concrete Problems Taken from the Larger Social World

The recent effort on the part of text-book writers and teachers to make arithmetical problems "real" and "concrete" has not always recognized the above mentioned psychological principle. The terms "real" and "concrete" have been interpreted in many ways, beside in terms of the child's consciousness. With some, "real" has meant "material," and the problems, more particularly with primary children, have, in increasing degree, been presented by objects or words connoting very vivid images. Others have defined this quality in terms of actual existence or use in the larger social world. If these problems actually occur at the grocer's, the banker's, or the wholesaler's, it is said that they "are indeed concrete." And much effort has been expended in carrying these current problems into the class room, in spite of the fact that they may be neither comprehensible nor interesting to the pupil.

Real and Concrete Problems Taken from the Child's Own Life

There is another social world, nearer home to the child, from which a more vital borrowing can be made. There is an opportunity to use the child's life in its quantitative aspects, to take his plays, games, and occupations, and introduce their situations into his mathematical teaching. As his world expands from year to year, he will be carried by degrees from personal and local situations to those of general interest. The teacher can provide this progression without devitalizing the facts presented.

The Imaginative or Hypothetical Problem

There is another error into which both the socially-minded radical and the specialist in child study fall. In their eagerness to improve the arithmetical problem, they assume that problems taken from the larger social world or from the child's experience are necessarily superior to hypothetical, imaginative or "made up" problems. The psychological fact that needs to be forced upon the attention of the reformers is that, with proper artfulness, an imagined problem may be even more vital and real to the child than one taken from life—as a situation in a drama may be more appealing and real to a child than one on the street. This has some recognition, but not enough. Those who stand upon the side of the "made-up" problems are more likely to be reactionaries who tolerate the traditional type of problem even though its stupid artificiality is obvious to both the teacher and the child. They might better be dealing with dull problems borrowed from real life than with specially invented dullness.

Valid Arguments for Actual Problems

Of course there is another argument for the use of actual social materials. The child must ultimately come into command of precisely these facts, since their mastery will be demanded by the business world. But must a primary school child study his arithmetic through problems taken from the dreary statistics of imports and exports merely because tariff reform is a political issue which every citizen ought finally to comprehend? There is a time for this, and, as is the case with most of such borrowed business problems, the time is later. In so far as these are current situations within the contacts of child life, let them enter. A quantitative revelation of life is important, and it is good teaching economy to gain knowledge by the way, provided it does not distract attention from whatever main business is at hand.

Unity in the Subject Matter of Problems

The socializing of arithmetical problems has one other additional good effect. It has tended to bring some topical unity into the problems constituting the assignment for a given lesson,

or group of lessons. Hitherto, a series of problems was almost always composed of a heterogeneous lot of situations. There was no unity save that some one process was involved in each. The movement is now in the direction of attaining a more approximate unity within the subject matter of the problems themselves. The difficulties of attainment have restricted this movement to more progressive circles.

The Eclectic Source of Problems

The eclectic source of arithmetic problems is apparent from the foregoing discussion. It would seem that some better texts would naturally be evolved through the implied criticism of each movement upon the other. Such is the case. Problems from child life emphasize the beginning condition to which adjustment must be made in all good teaching. Those from the greater world suggest the final goals of instruction. Those "made up" by the teacher call attention to what is too often forgotten, that the educative process in school may be artful without becoming artificial. Teaching is art, and when well done is not less effective for the fact.

CHAPTER XII

CHARACTERISTIC MODES OF PROGRESS IN TEACHING METHODS

Variation in Method and its Causes

The existing methods of teaching arithmetic in the American elementary schools are exceedingly varied. This is due to many causes. The democratic system of local control, as opposed to a centralized supervision of schools, has increased both the possibility and the probability of variation. Even within the units of supervision (state, county and municipal) the opportunity for reducing variation in the direction of a more efficient uniformity is lost. This is partly due to the lack of a thoroughly trained staff of supervisors of the teaching process. Uniformity beyond the legal units of supervision has been restricted by the lack of organized professional means for investigation of and experimentation in controversial matters. Even such crude experiments as are being tried in more than one class room, school or system are unknown, unreported, unestimated, because no competent professional body gathers, evaluates, and diffuses such knowledge. In this respect the teaching profession is far below the efficient organization of the legal and medical professions.

Characteristic Traditions and Reforms

It is exceedingly difficult therefore to analyze the characteristic aspects of teaching method except as these are interpreted in movements of general significance. These may be actual or potential, traditional or reformatory, general or local in present acceptance. The situation is one wherein tradition is mixed with radicalism, and radicalism modified by reaction. In this medley of movements there are dominant tendencies both traditional and progressive.

Forces for Progress in Method

It is quite impossible to indicate the progressive tendencies with clearness save in connection with the discussions of concrete difficulties in mathematical teaching. The forces that are behind these tendencies may, however, be summarized here. For convenience, they may be classified into eight types of influence, extending from more or less vague and general movements to very particular, scientific contributions. No attempt is made to indicate the achievement of each; the form of each influence is only roughly defined, and illustrative movements or studies suggested.

General Pedagogical Movements

(1) It is obvious that any general pedagogical movement which influences the professional attitude of teachers will influence the special methods of mathematical teaching. The appearance of the doctrine of interest made mathematical instruction less formal. The growing enthusiasm for objective work enlarged the use of objects in the arithmetic period. The child study movement laid emphasis upon the child's own plays and games as a source of problems and examples.

Special Pedagogical Movements

(2) Certain special movements in methods of teaching, local to the subject of mathematics, have also been effective. Here one has only to recall the "Grube" method, with its influence on the order and thoroughness with which the elements of arithmetic are taught.

Daily Trial and Error

(3) The tendency of every teacher, who is at all sensitive to the defects of his methods, is to vary his daily practice. Constant trial, with error eliminating and success justifying a departure, is thus a source of progress. The new devices of one teacher are taken up by the eager professional witness and innovation is thus diffused. We have no ability to measure how much professional progress is due to individual variation in teaching and its conscious and unconscious imitation. The disposition of school systems to send their teachers on tours of

visitation without loss of salary is a recognition of the value of this method of advance.

Experimentation of Progressive Teachers

(4) A far more efficient and radical source of change than that just mentioned is the deliberate, conscious, experimental teaching of progressive individuals. Some new idea or device occurs to the teacher of original mind, and it is tried out with a fair proportion of resulting successes. An illustration of such a contribution is found in one conspicuous effort to get more rapid column addition. The first columns to be added were allowed to determine the selection and order of addition combinations learned. Thus if $6+7+9+6+7=35$, is the first column to be used, then the first combinations mastered will be $6+7=13$, $3+9=12$, $2+6=8$, $8+7=15$. Arising as a fruitful idea and seeming to give a measure of success, it has been carried, in the particular locality in mind, from school to school, and from system to system.

Reconstruction through Psychological Criticism

(5) A prolific source of radical change is found in the critical application of modern psychology to teaching methods. Algorisms, types of difficulty, the order and gradation of these, as well as many other factors in method have been radically reorganized on psychological grounds. Examples of such psychological modifications of method are found in the "Courses of Study for the Day Elementary Schools of the City of San Francisco." Still more extensive critical applications are found in the "Exercises in Arithmetic" devised by Dr. E. L. Thorndike, Professor of Educational Psychology in Teachers College, Columbia University

Studies in the Special Psychology of Mathematics

(6) Attempts have been made to inquire into the special psychology of arithmetical processes through careful experimentation and control. They have not been numerous, nor have they been influential on current practice. Such a field needs development. A typical attempt to investigate and formulate the special psychology of number is found in a Clark University

study of "Number and its Application Psychologically Considered."[1]

Investigations of Existing Methods

(7) Educational investigations as to the efficiency of existing arithmetical teaching among school systems, sufficiently varied to be representative of American practice, have also been conducted. These have usually gone beyond the field of the special methods of presentation employed in the class room, and have inquired into the conditions of administration and supervision, the arrangement of the courses of study, and other similar factors. Dr. J. M. Rice's studies into "The Causes of Success and Failure in Arithmetic"[2] investigated such specific factors as: The environment from which children come, their age, time allotment of the subject, period of school day given to arithmetic, arrangement of home work, standards, examinations, etc. A subsequent study of similar type, but employing more refined methods is that of Dr. C. W. Stone on "Arithmetical Abilities and some Factors determining them."[3] The main problem of this study was to find the correlation between types of arithmetical ability and different time expenditures and courses of study. These two studies have probably attracted more general notice than any other studies of arithmetical instruction. While they have largely dealt with administrative conditions that limit teaching method, rather than with the details of teaching method itself, they have stimulated the impulse to investigate conditions and practices of every type.

Special Experiments in Controlled Comparative Teaching

(8) The latest source of progress in teaching method is found in the movement for comparative experimental teaching under normal but carefully controlled conditions. Several such experiments are being conducted in the Horace Mann Elementary School of Teachers College, Columbia University, under the direction of Principal Henry C. Pearson, with the co-operation

[1] Phillips, D. E. Number and its Application Psychologically Considered. *Pedagogical Seminary*, 1897-8, Vol. 5, pp. 221-281.

[2] Rice, J. M. Educational Research: Causes of success and failure in schools. *Forum*, 1902-3, Vol. 34, pp. 281-297, 437-452.

[3] Stone, C. W. Arithmetical Abilities and some Factors determining them, Columbia University Contributions to Education, Teachers College, N. Y. City, 1909, p. 101.

of the staff of Teachers College. The experimental work conducted by the instructors and students of Teachers College is primarily designed to determine the relative value of competing methods in actual use throughout the country, the assumption being that every substantial difference in practice implies a difference of theory and consequently a controversy that can be resolved only on the basis of careful comparative tests. Two parallel series of classes of about the same age, ability, teacher equipment, etc., are selected for this work. One series is taught by one method; the other series by the other method. The abilities of these children is measured both before and after the teaching, and the growth compared. The standards and methods of this type of comparative experimentation, together with a list of current competitive methods requiring investigation, are given in Dr. David Eugene Smith's monograph on " The Teaching of Arithmetic."[1]

[1]Smith, D. E. The Teaching of Arithmetic, Chap. XVI, Teachers College, January, 1909.

THE HIGHER GIRLS' SCHOOLS OF PRUSSIA

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Report No. 1

BY

C. WILLIAM PRETTYMAN, PH. D.

Professor of German, Dickinson College, Carlisle, Pa.
Honorary Fellow, Teachers College,
Columbia University

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PREFACE

The following study is based on observations made in the higher girls' schools of Prussia during a four months' sojourn in the winter of 1910-1911. The principal works of the extensive literature on the subject were also consulted; the more important of these are mentioned in the bibliography and the notes.

I wish to take this opportunity to express my appreciation of the courteous treatment which I received at the hands of the various principals and teachers of the schools which I visited. They were not only perfectly willing for me to visit the classes at any time but likewise sacrificed much of their valuable time in answering my numerous questions. Lack of space prevents my mentioning all to whom I am indebted but I desire to thank especially Professor Löschhorn and the staff of the *Königliche Augusta Schule* in Berlin, where I spent ten days and where I was enabled to become acquainted with all the different departments of the new girls' school and the affiliated institutions.

A word may be in order concerning the title of the study. After much debate I decided, for the sake of brevity, to call it "The Higher Girls' Schools of Prussia," though it will be evident from the following pages that the higher girls' school is only one of the institutions described.

This is perhaps as good a place as any to call attention to the fact that the girls' schools here treated must be distinguished on the one hand from the Elementary School (Volksschule) with an eight years' course and on the other from the Intermediate (Mittelschule) with a nine years' course.

In conclusion I wish to thank Dean Russell and Professors Sachs, Farrington, Strayer and Suzzallo of Teachers College for to them I owe the suggestion, which resulted in the present report.

C. W. P.

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THE HIGHER GIRLS' SCHOOLS OF PRUSSIA

I

HISTORICAL INTRODUCTION

Like most institutions the Prussian system of higher girls' schools is an evolution. It did not suddenly spring into existence with the reform regulations of 1908 but is the result of forces, which for years have been at work among the people. Such being the case, it will be necessary for us to trace briefly the history of female education in Prussia up to 1908 in order to understand fully the epoch-making reform of that year.[1]

As in the case of other European nations we must seek the beginnings of German female education in the church. It was to the cloister schools that the Germans sent their daughters in the ninth and tenth centuries and here they received instruction not only in books but also in music, sewing and other feminine occupations. Already in the year 900 there were seventy of these cloisters.[2]

At first the instruction in these schools was not of a very high order but in the tenth century there was a great improvement in the character and extent of the subjects taught. This improvement was most noticeable in the Saxon cloisters. Just how highly they were esteemed may be seen from the fact that

[1]This historical sketch is based largely on the works of Lyster, Lange, Bäumer, Rein, and Paulsen. See Bibliography.

[2]Quoted by Bäumer from Hauck's Kirchengeschichte Deutschlands.

boys who were preparing for the priesthood were sent to them for their first training.

Up to this time the cloister schools were intended primarily for prospective nuns, but from now on we find other girls attending them. These latter received their education in the so-called external schools, where the greatest stress was laid on reading, writing, and a study of the Psalms; but they were also taught various kinds of feminine handiwork. The education furnished in the cloister school was intended primarily for girls of noble birth but there is evidence that girls of lowly birth had also a rudimentary education.

The institution of chivalry, which effected such a profound change in German life and letters, had also a marked effect upon the education of women. It was now no longer necessary to be able to read only the Bible but also, if not actually necessary yet highly desirable, to read the interesting works of contemporary poets. With the decay of knighthood came a change in man's attitude toward woman, which resulted greatly to her disadvantage. Likewise the growth of cities and the substitution of German for Latin called into existence a great number of private schools. These were conducted by poor priests and by the widows of working men and, needless to say, were in no way comparable to the cloister schools which they were transplanting.

In the period of the Reformation the girls' school became for the first time a public institution and schools sprang up to furnish girls of all classes with an education suitable to their needs. The educational seeds planted during the period of the Reformation were killed by the Thirty Years' War. The small private schools, conducted usually by anybody but educators, increased in number and frequently helped to ruin rather than to educate their pupils. In this dreary time the Catholic cloisters again took up with vigor their task of educating the young and once more became the only place where it was possible for a girl to get anything more than the education of the Volksschule. Things continued in this condition till the turn of the century when Francke established in Halle his *Gynaeceum*, which may be regarded as the first higher girls' school in Germany. This institution, established in 1698, was an imitation of the famous

school of Madame de Maintenon at St. Cyr. In it the French demoiselle, whose business it was to teach the girls French and deportment, played a leading rôle.

The period of Enlightenment favored the higher education of women, but despite the views held by the leaders of the movement little was done to put the education of girls on a firmer footing; as before they still received their training in the home under a tutor or demoiselle.

Next comes Rousseau with his ideals and with his famous phrase "la femme est faite specialement pour plaire à l'homme," and we have the sentimental woman who makes new demands upon the educational institutions of the time. Inspired by Rousseau's "Emile" a whole flood of educational works swept over Germany, but they did not result in the establishment of new public institutions. Up to the end of the eighteenth century the girls' schools were either private ventures or were established by philanthropic princes. Girls who did not attend these schools were educated at home.

With the establishment of the Ober-Schulkollegium in 1787 education became in Prussia the business of the state. After the years of French oppression the demand for female education became greater and greater and to meet this demand public schools for girls were established.[1] In these schools there was lacking a unifying principle and there existed among them the greatest diversity of aims and methods. It was the belief among people interested in the subject that the only means of remedying this condition was to come to some agreement as to the aims to be pursued. The first efforts in this direction were made in 1848, when Director Schornstein of Eberfeld called an assembly of teachers in girls' schools to discuss the following points: (1) The necessity of an internal and external unity in girls' schools and the means of obtaining it. (2) The position of girls' schools in reference to other institutions. (3) The leading principles of female education. The concensus of opinion of this assembly was that the girls' schools ought to be state institutions. This meeting had no practical results so far as the government was

[1]To 1820 there were 22 public higher girls' schools, 1821-1840 there were 34, and 1841-1860 there were 47. Quoted by Bäumer from Nöldeke.

concerned and we must wait till 1872 before we find any radical change taking place in the higher girls' schools.

No one who reads the history of German Education can miss the significance of this year. The particular event which gives it importance was the conference called together by Director Kreyenberg of Iserlohn. It was composed of 164 teachers, 54 of whom were women, and met in September in Weimar. It is known as the Weimar Conference. Its purpose was to crystalize the prevailing views on female education. The result of the conference was a memorial which, in the course of the year, was sent to the various governments. Since this document sums up the situation as it existed in 1872 and since it likewise contains so much that is still retained in the system to-day, it will be worth while to see what were its principal demands. They were as follows: That the higher girls' school with a ten years' course should be under state control and under the same jurisdiction as the boys' school; that the curriculum contain two foreign languages; that the staff consist of academically trained teachers who should have salaries and pensions the same as the teachers in the higher boys' school; that the higher girls' school be distinguished from the middle school; and that state normal schools be established for the training of teachers.

As a result of the Weimar Conference Minister Falk summoned a conference in August, 1873. This conference confirmed practically all of the demands of the Weimar conference, but did not give them the sanction of law; nevertheless the conclusions here reached may be considered as the foundation upon which has been erected the present system of female education. They are as follows:[1] The higher girls' school must have a ten years' course; teach two foreign languages; the staff must consist of academically and seminary trained men teachers and women teachers; and should be under the jurisdiction of the provincial school board.

In order to hold fast what had been gained and to make propaganda for the cause of female education, the promoters of the Weimar Conference called another meeting in Hanover in

[1]The complete record of the transactions is found in Protokolle über die im August 1873 im Königlich Preussischen Unterrichtsministerium gepflogenen, das mittlere und höhore Mädchenschulwesen betreffenden Verhandlungen (Berlin, 1873).

September 1873, where they formed an association, "The German Association for the Secondary Education of Girls." The purpose of this association, which has had such a tremendous influence in the development of female education in Germany, is "to further the inner and outer development of the middle and higher girls' schools on the lines laid down in Weimar in 1872." Their official organ was the *Zeitschrift für weibliche Bildung in Schule und Haus,* the name of which was changed in 1902 to *Frauenbildung.*

Even at the Weimar meeting there was observable a marked difference of opinion between the representatives of the private schools and those of the public schools. Since men prevailed in the public schools and women in the private, it was in reality a difference of opinion as to how much women should have to do with the education of girls, particularly in the higher grade. This difference of opinion was still more marked at the meetings of the association held in Dresden in 1875 and in Cologne, 1876. In the meeting at Eisenach in 1888 the women teachers, who believed that girls ought to have mostly women teachers in the upper grade, established a separate organization known as "The General German Association of Women Teachers," with an official organ *Die Lehrerin in Schule und Haus.* The aim of this new association was to effect a general improvement in the condition of women teachers and to obtain for them a larger share in the education of the people, particularly in the upper grade of the higher girls' school. At their meeting in 1891 this association decided to present to the various governments a petition urging an improvement in the scientific training of women teachers. Sept. 12, 1892, they presented the petition to the Prussian minister, Dr. Bosse.

In the meantime the older association had, at their meeting in Heidelberg in 1890, formed a special division for the affairs of women teachers. This association had likewise sent a petition to the Prussian government on Sept. 25, 1892. To both petitions the government replied that it was already working on plans for the accomplishment of the ends proposed in the petitions.

This division of forces was regarded at the time as unfortunate, but whatever may be said *pro* or *con,* it is certainly true

that the agitation begun at that time has kept the question of the education of girls before the public and has had much to do with the reforms that have been effected. We are now at the threshold of 1894, a never-to-be-forgotten year in the history of female education in Prussia.

The Prussian government had, of course, not been deaf to the many voices raised in demand for reform. As Minister Bosse had said, it had been giving the matter earnest thought and on May 31, 1894 it issued the famous regulations[1] *über das Mädchenschulwesen, die Lehrerinnenbildung und die Lehrerinnenprüfung.* These regulations prescribed a nine years' course; special elective courses for the education of girls after the completion of this course; the teaching of two foreign languages; and a higher examination for women teachers, which would give them the title of Oberlehrerin and the right to teach in the classes of the upper grade. These regulations did not, of course, satisfy all the parties interested but they were, nevertheless, universally regarded as a triumph. The chief objections to them were that they prescribed a nine years' instead of a ten years' course; that they made no change in the teaching staff; that the elective courses gave opportunity for superficiality, and that the higher girls' school was not made subject to the provincial school board.

The next important step was taken in 1899 when the girls' school received a special department in the ministry in the division of Elementary Schools. In charge of this department was placed Dr. Wätzold, the champion of female education. With his appointment hope again sprang up that the whole system would soon be revised but his premature death, before he had elaborated his plans, blighted these hopes. The question was, however, kept constantly before the people and from time to time was the subject of serious debate in the house of representatives. As early as 1902 the minister of education, Dr. Studt, in a speech before the house, enunciated the principles which would guide the ministry in any new reform of the girls' schools. After assuring the house that the government was following the whole movement with great interest, he stressed the following points:

[1]For full text of regulations, see *Zentralblatt,* 1894, p. 446.

(1) The training of women and their special training for a specific calling will be the point of view of the government.

(2) The higher girls' school must be clearly separated from the middle school.

(3) German shall occupy a central place in the curriculum.

(4) More important than the extension of scientific knowledge and social graces is an improvement in the education of girls in the direction of the general problems now claiming the attention of the educated woman.

In conclusion he said: "I may summarize the principles which the government has followed and will continue to follow in the future as follows: the ideal position of the German woman in the family shall be preserved as far as possible."

Notwithstanding these assurances of interest and good intentions nothing definite was done, and the girls' school was repeatedly the subject of debate in the house. On Feb. 28, 1905, Dr. Schwarzkopf of the ministry, in reply to a satirical speech of representative Hackenberg, called attention to the statements made by the minister in 1902; stated that the principles then enunciated were still controlling the actions of the government; and explained the delay as due to the death of Dr. Wätzold. He made this promise which is full of hope for the future: "I may say that the minister of education is constantly giving this matter his closest attention and it is hoped that in the not far distant future we shall arrive at results which will correspond to the present needs."

On Jan. 23 and 24, 1906, there assembled at the invitation of the minister in the auditorium of the ministry a conference to discuss the government plans of reform. This conference consisted of forty-five men and women selected from the most distinguished educators in Germany.[1] At the conclusion of the meeting the ministry assured the members that the suggestions made at the conference would be carefully weighed and tested.

The friends of the cause felt that the reform of the girls' schools would now soon take place. On Oct. 11-12 there convened in Cassel the congress of the higher education of women. There were present a thousand women and a few men. The

[1]For a list of those present and a detailed account of the proceedings, see *Frauenbildung*, vol 5, 207-214.

object of the meeting as stated by the president, Mrs. Steinmann, was "the finding of a way for the better education of women." As a matter of fact it was a protest against the government plan. At the conclusion of the meeting resolutions were passed covering the following points: The higher girls' school; preparation for the university; education of women beyond the girls' school; coeducation; training of teachers; the position of the higher girls' school in the educational system of Prussia. Subsequently these resolutions were presented to Minister Holle by a delegation of ladies. "Mrs. Steinmann, who acted as chairman of the committee, explained to the minister the general plans agreed upon and showed in what way they differed from the government plan of reorganization. The minister requested the ladies to set aside all differences and aid in securing the reforms planned by the government, so that the legislature might accept that plan and thus move in the direction of possible development. The chiefs of the division of secondary schools in the ministry discussed all the resolutions of the Cassel congress, as well as the bill before the diet."[1] There was now nothing to do except wait for the new regulations and see in how far they met the wishes and expectations of the various parties concerned.

Let us pause now and look at the official status of the higher girls' school. It is practically the same as it was in 1894. How little the situation had changed may be seen from the following quotations from histories of the subject dating from earlier times up to 1908. Writing in 1900 Miss Lyster[2] says: "Although the higher school for girls was clearly enough defined by these regulations (i.e., of 1894), nothing was said to put it officially in the same category with the higher boys' school. In 1904 Dr. Bäumer[2] says: "The demand of the heads of the higher girls' schools that these generally be put under the oversight of the provincial school board has not yet been granted by the government." Again in 1908, Miss Martin thus describes the unsatisfactory state of affairs:[2] "Thus today in reference to the system of girls' schools Germany presents the picture of a theoretical and practical disunion, which may well be com-

[1] Report of Commissioner of Education, 1907, p. 184.
[2] See Bibliography.

pared to the political diversity of the seventeenth century. Who will change it?"

Having now traced the history of female education in Prussia up to 1908 let us consider the defects of the old system which made a reform necessary. We shall then be in a position to see how far these defects have been remedied. An excellent statement of the case is given by Dr. Seehausen,[1] whose results may be summarized as follows: Up to the time of the reform the state only provided for the establishment of higher girls' schools and normal schools, but made no provision for the further training of girls after they had completed the higher school; the elective courses did not meet this need. The course comprised only nine years, and in the curriculum too much stress was laid on training the feeling and not enough on training the understanding. The normal school in three years' courses trained for elementary and for both middle and higher schools, and compelled the girl to study and teach at the same time, which was too great a strain upon her health. Almost nothing was done for the future housewife and mother or for the girl who desired to go to the university. Finally the external affairs and teaching conditions were unregulated and it was consequently difficult to secure the best teachers for girls' schools.

We are now ready to study the new regulations and to look at the system of female education as it exists to-day.

[1]See *Pädagogisches Archiv,* Vol. 50, p. 456.

II

THE PRESENT SYSTEM OF HIGHER GIRLS' SCHOOLS IN PRUSSIA

The new system of secondary schools for girls in Prussia is still in a nascent state due to the recency of the reform. The present time is recognized by the government and the teachers as a period of transition from the old to the new. No description can therefore give a faithful picture of conditions as they exist in all parts of the kingdom, but the following chapter aims to give a clear account of the whole system as planned by the government. Many schools already are faithfully carrying out the new regulations and all schools which hope to be officially recognized must prepare themselves to do so. It will present the Prussian secondary girls' school as it will certainly exist for some time to come, for, although the new regulations are not entirely satisfactory to all concerned, it will be some time before any radical changes are made.

The present system of secondary education for girls in Prussia embraces the three following institutions, which will be immediately described in detail:

(1) The Higher Girls' School (*Die Höhere Mädchenschule*), which is the foundation, upon which is superimposed:

(2) The Lyceum (*Das Lyzeum*), consisting of (a) the Women's School (*Die Frauenschule*) (b) the Higher Normal School (*Das Höhere Lehrerinnenseminar*).

(3) The University Preparatory School (*Die Studienanstalt*).[1]

The Higher Girls' School

According to the regulations of August 18, 1908,[2] a H. G. S. is one which conforms to these regulations in regard to subjects

[1]The following abbreviations will be used for these various institutions: H. G. S., L., W. S., H. N. S., U. P. S.

[2]Bestimmungen über das höhere Mädchenschulwesen in Preussen. Berlin, 1910.

of instruction, number of periods, programs, and in which, as a rule, one half of the periods in the academic subjects[1] of the upper and middle grades are taught by university trained teachers. The H. G. S. has ten ascending classes, which are designated by X (the lowest) to I (the highest). The classes X, IX, VIII form the lower grade; VII, VI, V, the middle grade; and IV, III, II, I the upper grade. The minimum age at which a girl may enter the lowest class is six years.

In exceptional cases boys may be admitted to the classes of the lower and middle grades. By taking some extra work these boys may thus prepare themselves for tertia (i.e., fourth year) of a boys' secondary school. This entering wedge for coeducation is used as an argument by the coeducation party, who desire that girls may also be allowed to enter the boys' schools in those places where no girls' secondary school exists. As yet, however, the government has turned a deaf ear to their appeal.

In the H. G. S. all subjects are obligatory except needle work, which is optional in the upper grade.

The Lyceum

The Lyceum is intended to give to girls who have completed the course of the H. G. S. a further education, which will prepare them for their future careers. To quote literally from the regulations: "In addition to academic subjects it shall likewise offer instruction in domestic science and practical pedagogy in order to meet the educational needs of young women, according to their choice and inclination, and to give a worthy content to their inner life, which will protect them against superficiality and shallowness and at the same time show them ways and means of meeting the demands which the present time is making upon women."

This general education is supplied by

The Women's School

Girls who enter the W. S. must either have a leaving certificate from the H. G. S. or else they must satisfy the authorities of their ability to do the work. After completing the two years'

[1]For meaning of academic subject, see program of H. G. S.

course the student receives a certificate; if she leaves before the expiration of two years, she receives only a statement of the work completed.

There are only two compulsory subjects in the W. S.,[1] pedagogy and kindergarten. In addition to these election is free, the minimum number of hours permitted being twelve and the maximum thirty. A student must remain in a course elected at least one-half year.

What has just been said applies to girls who do not intend to become teachers but who are simply preparing themselves for the duties of a housewife. The W. S. prepares, however, for certain sorts of teaching and first of all for domestic science. If a girl expects to enter this profession she must take in addition to pedagogy and kindergarten also domestic science, natural science, hygiene, civics, sewing, household economy, drawing, singing, and gymnastics. At the conclusion of her course she passes the examination for domestic science teachers,[2] and receives permission to teach this subject in elementary and middle schools. She does not have the right to teach domestic science in a H. G. S. To secure this privilege she must pass a second examination.[3]

In the next place the W. S. prepares girls for kindergarten teaching. This does not appear in the regulations, but for two years the course has been in operation at the Royal Elisbeth School in Berlin and the new regulations governing this department will probably appear in the course of this year. The course is known as the *Kindergärtnerinnen-Seminar* (training school for kindergarten teachers). At the conclusion of the course the students receive a diploma, which confers upon them the right to be kindergarten teachers in elementary schools and in families. In order to become directresses of kindergartens, they must take further training. The government likewise proposes to introduce this course for directresses of kindergartens into the W. S. The experiment will first be tried at a state school

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[1] For subjects of study and curricula see chapters on these subjects.

[2] See Bestimmungen über Ausbildung und Prüfung der Lehrerinnen der weiblichen Handarbeiten und der Lehrerinnen der Hauswirtschaft. Berlin, 1908.

[3] Cf. chapter on Training of Teachers under Domestic Science.

and when the details have been worked out there, the regulations governing the course will be published.

The Lyceum also has (b) *The Higher Normal School* with a four years' course. The first three years are devoted to academic studies, at the conclusion of which an examination is passed. The student then enters the fourth or practical year, at the end of which she passes another examination and receives the right to teach in the elementary school, in the intermediate school and in certain classes of the higher girls' school.

In order to enter the H. N. S. a girl must present a leaving certificate from a H. G. S. or must pass an entrance examination.

For the practical training of students in the H. N. S. there must be a practice school. In larger places this school is either a primary or intermediate school. When it is not possible to have a school the lower classes of the H. G. S. are used for practice work. In connection with the Lyceum there is also a kindergarten for the practical instruction of the students in the care of children.

The University Preparatory School

As the name implies, the business of the U. P. S. is to prepare girls for the university, i.e., it gives them the same training as the boys receive in the *Gymnasium,* in the *Realgymnasium,* and in the *Oberrealschule.* At the conclusion of the course a girl must prove by a leaving examination that she possesses the necessary maturity to start upon university study.

The U. P. S. has three different courses corresponding to the three higher schools for boys respectively. The oberrealschule course is five years; the realgymnasial and the gymnasial, six. The classes of the U. P. S. are known either by their numbers or by the corresponding names of the boys' school: viz., Upper and Lower *Prima;* Upper and Lower *Sekunda;* Upper and Lower *Tertia.* Class VI of the U. P. S. corresponds to lower *Tertia* of the boys' school.

To be admitted to the Oberrealschule classes a girl must present a certificate showing that she has completed the eight lower classes of a H. G. S. To enter the realgymnasial or gymnasial course she must have completed the seven lower classes

of a H. G. S. Girls who do not possess these certificates or who desire to enter any class of the U. P. S. other than the lowest, must pass an entrance examination. At the end of her course in the U. P. S. the girl passes the maturity examination and may then, if she so desires, pursue her studies at the university. If she decides at this time that she does not want to go to the university, she may enter the fourth, practical year, of the H. N. S. and after one year become a teacher. If she decides upon this course, she must pass a supplementary examination in Pedagogy, French, and English.

In order to make the situation perfectly clear let us take eight girls who desire different sorts of education and trace their progress through the various stages of their educational career. We shall assume that they all start at the earliest age of six years and that they are promoted at the end of each year.

The first girl has no aspirations for a career but desires simply a general education, which she may complete at the earliest possible date. She goes through the classes of the H. G. S., spending a year in each, and completes the course at the age of sixteen, when she receives her diploma.

Girl number two has likewise no craving for a career but does desire some further instruction which will prepare her for the duties of a housewife. She completes the ten years' course of the H. G. S. and then enters the W. S. where she remains for two years more. Upon the completion of this course she receives another diploma at the age of eighteen.

Girl number three decides to become a kindergarten teacher. After completing the H. G. S. she enters the *Kindergärtnerinnen-Seminar* (training school for kindergarten teachers), a part of the Lyceum, and after two years receives a diploma which gives her the right to be a kindergarten teacher in private families and in elementary schools.

Girl number four would like to become a teacher of domestic science. After completing the H. G. S. she enters the W. S. and after two years' study receives a diploma which gives her the right to teach domestic science in elementary and middle schools. If later she decides to become a teacher of domestic science in a H. G. S. she must have further training.[1]

[1] See chapter on Training of Teachers.

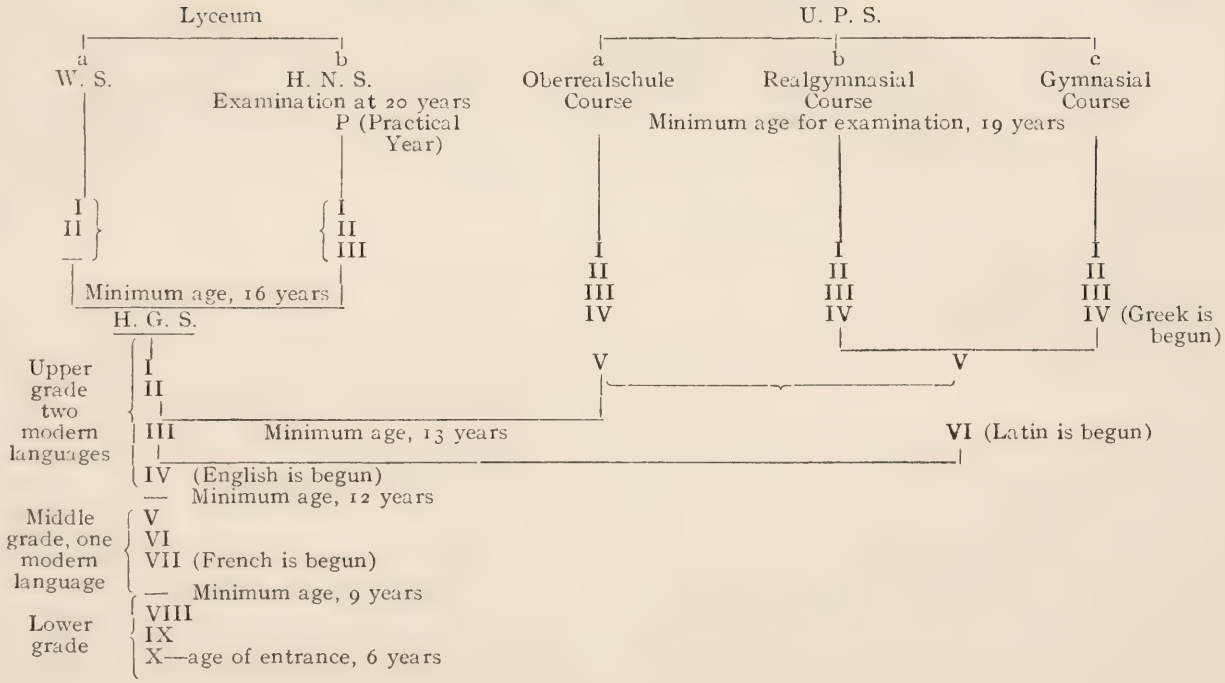
Girl number five decides at some time during her course in the H. G. S. that she will become a teacher. At present she has no thought of going to the university, thus preparing herself for the position of Upper Teacher, but is content to be an ordinary teacher. Like the preceding girl she completes the course of the H. G. S., but then enters the H. N. S. After completing three years of academic study, she passes an examination upon these subjects and then enters the practical year, at the expiration of which she passes another examination and receives a certificate which entitles her to teach either in the elementary school, in the intermediate school, or in the H. G. S. She is not an academically trained teacher because she has not studied at the university and has not passed the examination for higher teachers. If later on she decides to become a higher teacher she has that privilege. In that event her subsequent career may be traced in the chapter on the training of teachers.

Girl number six, having means, ability, and inclination, decides that she will pursue her studies at the university. She does not yet know what she will finally do, but that is not necessary as there will be time enough later for a decision. She has a decided talent for languages and decides that she will study both Latin and Greek; that is, she resolves to take the full gymnasium course or, to use our terminology, the full classical course. She is thirteen years old and has completed the seven lower classes of the H. G. S. Instead, therefore, of entering the next higher class of the H. G. S. she enters the lowest class of the U. P. S. and begins Latin. Two years later she takes up Greek, which she studies for four years, at the expiration of which time, at the age of nineteen, she passes her maturity examination and receives a certificate which entitles her to enter a university.

Girl number seven is like number six except that she does not desire to study Greek, so when the time comes to begin Greek, she enters the realgymnasial course, where she will get more modern languages. At the age of nineteen she passes the maturity examination and receives a diploma which gives her the right to study at the university.

Girl number eight differs from six and seven in that she does not desire to study either Latin or Greek. She remains one

THE NEW SYSTEM OF GIRLS' SCHOOLS



year longer in the H. G. S., when she enters the oberrealschule course and at the age of nineteen she likewise passes the maturity examination and receives a diploma which entitles her to study at the university.

This rather long explanation and illustration will, I hope, make the diagram on page 16, which is copied from the official regulations, perfectly clear.

The following statistics compiled from the January number of the *Zentralblatt* for 1911 will give an idea of the number of the different institutions at present recognized by the government.

There are 214 public and 212 private recognized higher girls' schools, nine of which have as yet not been opened. Of the public schools, 2 are at present without a director, 11 have women directors, and 201 have men. Of the private schools, 13 have men directors and 199 women.

There are 159 Lyceums, 80 of which are private and 79 public.

There are 77 Women's Schools, 29 of which are public and 48 private.

There are 127 Higher Normal Schools, 51 of which are private and 76 public.

There are 31 University Preparatory Schools, 2 of which are not connected with any other institution; 9 are connected with schools where there is no Lyceum, and the remainder are in connection with schools where there is a Lyceum. Of the U. P. S. 2 have gymnasial courses, 2 have oberrealschule courses, and 27 have realgymnasial courses. This number is always changing for the government is constantly recognizing new schools.

In conclusion a word may be said about the cost of education in the respective institutions. In the public schools the usual charge is 110 M.[1] in the lower grade, 140 M. in the middle and upper grade, 150 M. in the Lyceum, and 200 M. in the U. P. S. In private schools the cost will be usually about twice as much. While these charges may not seem very large to us they are nevertheless prohibitive to many German parents who have girls to educate. The school must, therefore, provide for pupils who are unable to pay. To do this they furnish from fifteen to

[1] 1 Mark = 24 cents.

twenty per cent free places. Furthermore, practically every school has a fund, the proceeds of which are used in helping poor girls through the university, for purchasing text-books for needy pupils, and for sending students on trips during their vacation. The money is contributed by parents, by graduates, and by friends of the school. Sometimes the gifts are quite substantial, as may be seen from the following report of a school for the year 1909-1910.

30 M. from a former pupil.
104 M. from a concert given by a friend.
116 M. from a reading by one of the actors of the royal theatre.
375 M. from a performance of "Don Carlos" by the members of a class of the U. P. S.
1000 M. from the father of one in the graduating class.

III

ADMINISTRATIVE ORGANIZATION OF THE SCHOOLS

The control of all matters pertaining to education is lodged with the Ministry of Public Worship and Instruction and Board of Health (*Ministerium der geistlichen Unterrichts- und Medizinal-Angelegenheiten*),[1] usually called the *Kultus-Ministerium*. At the head of the ministry stands the *Kultus-Minister*, who is thus the minister of education.

The educational department of the ministry is divided into two sections, each under a director. One section controls the universities, scientific institutions, higher boys' and girls' schools, schools of technical art and education; the other controls the elementary and normal schools, schools for physical training and institutions for idiots, the deaf, the dumb, and the blind.

The Kultus-Minister is the final authority on all matters pertaining to education. He, with his directors, after due deliberation and conference with experts, decides the policy which must be pursued. He interprets the existing laws and decides all questions which may arise in administering them. There is nothing too lofty nor too humble to come before this august tribunal. To one who is not used to a highly centralized form of school government, a study of the decisions handed down by the minister is very interesting.[2]

Between the ministry and the school stands the Provincial School Board, one of which is found in each of the twelve provinces into which the Kingdom of Prussia is divided. The head of the board is the highest official in the province, the Ober-

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[1]Until 1817 it had formed a department of the Ministry of Interior, this educational department of the Home Office having, in its turn, replaced in 1808 the Ober-Schulkollegium (Central School Board) founded by Zedlitz under Frederick William II (Lawrence).

[2]These and all other matters pertaining to education are published in the *Zentralblatt für die gesamte Unterrichtsverwaltung in Preussen.*

Präsident, who is assisted by four or five counsellors (*Schulräte*). This board has jurisdiction in the following matters:

1. All subjects bearing on the educational aim of the school.
2. The organization of the school.
3. The examination of new, and revision and confirmation of already existing, ordinances and regulations.
4. Provision for the removal of abuses, which have crept into the school system.
5. Examination of text-books in use; decision as to which are to be dispensed with or what new ones are to be introduced.
6. The appointment of commissions to hold leaving-examinations.
7. The supervision, direction and inspection of all schools which prepare for the university.
8. The appointment, promotion, discipline, suspension, and dismissal of teachers in these institutions.
9. The control of financial affairs.

The reform of 1908 placed the Higher Girls' School under the jurisdiction of the Provincial School Board, thus placing it in the same category with the Higher Boys' School. Previous to this only certain schools were responsible to this board; others were responsible directly to the government of the province, or to the district school inspectors, or to the local school boards.

All state schools are directly responsible to the Provincial School Board. City schools, on the other hand, are only indirectly responsible to it. They are directly responsible to the local school board, which usually consists of the mayor, members of the city council, and several directors of the higher schools. The members of the local board must be confirmed by the Provincial School Board. The local board elects the director of the school and the teachers, pays their salaries and pensions, and has jurisdiction in the external affairs of the school, but has no direct authority in matters of discipline or instruction.

All public schools are under the general control of the state and are subject at all times to state inspection. The examination of the pupils is likewise a state matter.

The ministry does not deal with the schools directly but through the Provincial School Board. If a teacher in a state school wishes to communicate with the ministry he sends his

communication to the director, who sends it to the Provincial School Board, who in turn send it to the ministry. Communications to directors or teachers of city schools go through the hands of the mayor and, inversely, communications from directors or teachers must go first to the mayor, then to the Provincial School Board, then to the ministry.

All private schools, which are recognized by the government, are likewise under the jurisdiction of the District School Board, to which they are responsible for all matters pertaining to the educational side of the school. In matters pertaining to health of the children and arrangement of buildings, etc., they are responsible to the city authorities.

IV

THE PROGRAM

H. G. S.

	Academic Subjects									
	Lower Grade			Middle Grade			Upper Grade			
	X	IX	VIII	VII	VI	V	IV	III	II	I
1. Religion	3	3	3	3	3	3	2	2	2	2
2. German	10	9	8	6[1]	5	5	4	4	4	4
3. French	—	—	—	6	5	5	4	4	4	4
4. English	—	—	—	—	—	—	4	4	4	4
5. History[1] and history of art	—	—	—	—[1]	2	2	2	2	2	3
6. Geography	—	—	2	2	2	2	2	2	2	2
7. Mathematics	3	3	3	3	3	3	3	3	3	3
8. Natural sciences	—	—	—	2[2]	2[2]	2[2]	3[3]	3[4]	3[5]	2[6]
Total	16	15	16	22	22	22	24	24	24	24

[1] German and historical stories.
[2] Botany and zoology.
[3] Botany, zoology and mineralogy.
[4] Botany, zoology, chemistry, and physics.
[5] Botany, chemistry, physics, zoology, and anthropology.
[6] Physics and chemistry.

	Formal Subjects									
9. Writing	—	3	2	1	1	1	—	—	—	—
10. Drawing[1]	—[1]	—[1]	—[1]	2	2	2	2	2	2	2
11. Needle work[2]	—	2	2	2	2	2	(2)	(2)	(2)	(2)
12. Singing	1	1	1	2	2	2	2	2	2	2
13. Gymnastics	1	1	1	2	2	2	3	3	3	3
Total	2	7	6	9	9	9	7 (9)	7 (9)	7 (9)	7 (9)

[1] In classes X to VII drawing and modelling are taught occasionally in German classes.
[2] Elective in upper grade.

W. S.

	II	I	
1. Pedagogy	2	2	
2. Domestic science	5[1]	5[1]	
3. Kindergarten	4[2]	4[2]	
4. Care of children and hygiene	4[3]	4[3]	
5. Law and practice of citizenship, natural economy	2[4]	2[4]	
6. Household accounts (bookkeeping)	1	1	
7. Needle work	2	2	
8. Religion			Two hour courses, taken according to needs and desire of students.
9. German literature			
10. Foreign languages (French, English, Latin, Italian)			
11. History, Geog., Nat. science			
12. History of art			
13. Gymnastics			
14. Drawing and painting			
15. Music			

[1] Includes cooking and housekeeping.
[2] Includes practice in kindergarten.
[3] Includes practical work in the day nurseries.
[4] Includes visitation of charitable institutions.

H. N. S.

Academic Subjects

	Academic Training Classes			Practical year
	III	II	I	
1. Religion	3	3	3	1
2. Pedagogy	2	2	2	3
3. German	3	3	3	1
4. French	4	4	4	1
5. English	4	4	4	
6. History	2	2	2	1
7. Geography	2	1	1	
8. Mathematics	4	4	4	1
9. Natural science	2	3	3	1
10. Instruction in teaching and practice teaching	—	—	4[1]	4
11. Teaching in the school	—	—	—	4–6
12. Scientific exercises[2]	—	—	—	8
Total	26	26	26	26

Formal Subjects

13. Drawing	2	2	1	—
14. Singing	1	1	1	—
15. Gymnastics	3	3	3	3
Total	6	6	5	3

[1] These are given in the regular hours.
[2] These are intended to lead to independent study and correspond to the university *seminar*.

U. P. S.

OBERREALSCHULE COURSE

Obligatory Academic Subjects

	V	IV	III	II	I
1. Religion	2	2	2	2	2
2. German and philosophical propaedeutics	4	4	4	4	4
3. French	4	4	4	4	4
4. English	4	4	4	4	4
5. History	2	2	2	2	2
6. Geography	1	1	1	1	1
7. Mathematics	4	5	5	5	5
8. Natural science	4	4	4	4	4
Total	25	26	26	26	26

Obligatory Formal Subjects

9. Drawing	2	2	2	2	2
10. Gymnastics	3	3	3	3	3
Total	5	5	5	5	5

Elective Subject

Singing	1	1	1	1	1

U. P. S.

REALGYMNASIAL COURSE

Obligatory Academic Subjects

	VI	V	IV	III	II	I
1. Religion	2	2	2	2	2	2
2. German and philosophical propaedeutics	3	3	3	3	3	3
3. Latin	6	6	6	6	6	6
4. French	3	3	3	3	3	3
5. English	3	3	3	3	3	3
6. History	2	2	2	2	2	2
7. Geography	1	1	1	1	1	1
8. Mathematics	4	4	4	4	4	4
9. Natural science	3	3	4	4	4	4
Total	27	27	28	28	28	28

Obligatory Formal Subjects						
10. Drawing	2	2	2	2	2	2
11. Gymnastics	3	3	3	3	3	3
Total	5	5	5	5	5	5

Elective Subject						
Singing	1	1	1	1	1	1

The program of classes VI and V is the same as that of these classes in the gymnasial course. Likewise in classes IV to I the pupils of the realgymnasial course can be taught together with those of gymnasial course where the work hours are the same (Religion, German, Latin, History, Geography, Gymnastics, Singing). In Religion, History, Geography and the technical subjects, they may be taught together with those of oberrealschule courses.

U. P. S.

GYMNASIAL COURSE

Obligatory Academic Subjects

	VI	V	IV	III	II	I
1. Religion	2	2	2	2	2	2
2. German and philosophical propaedeutics	3	3	3	3	3	3
3. Latin	6	6	6	6	6	6
4. Greek	—	—	8	8	8	8
5. French[1]	3	3	2	2	2	2
6. English[1]	3	3	—	—	—	—
7. History	2	2	2	2	2	2
8. Geography	1	1	1	1	1	1
9. Mathematics	4	4	3	3	3	3
10. Natural science	3	3	2	2	2	2
Total	27	27	29	29	29	29

Obligatory Formal Subjects						
11. Drawing	2	2	—	—	—	—
12. Gymnastics	3	3	3	3	3	3
Total	5	5	3	3	3	3

Elective Subjects						
13. Singing	1	1	1	1	1	1
(11) Drawing	—	—	2	2	2	2

[1] In the four upper classes either English or French may be taken.

V

THE CURRICULUM

In this chapter I shall endeavor to give an idea of the studies pursued in the various institutions which have been described. Any one desiring more detailed information may consult the instructions of the minister. As far as I was able to judge the regulations are carried out by the teachers. As a rule each instructor had a well-thumbed copy of that part of the instructions which pertained to his work, and an inquiry concerning the nature and amount of work done by the class was usually answered by a reference to this book.

The most conspicuous place in the curriculum is still held by Religion and German, a fact emphasized by the minister in speaking of the changes which were made in reforming the schools.

Religion, as may be seen from the programs, is obligatory everywhere except in the W. S. The object of the course is "to acquaint students with the Scriptures; to familiarize them with the rise and development of the Christian Church; to awaken and encourage in them an interest in religion and a desire to participate in the religious life of a community."

In the H. G. S. the instruction in the lower grade is very elementary and no book is used. Bible stories are related, particularly those concerning Christ. The children commit to memory verses, short prayers, and parts of hymns. In the middle grade a text-book is used and the nature of the instruction is changed to meet the more mature age of the pupils. The work here covers stories from the Old and New Testament, parts of the catechism, some of the simpler Psalms and church hymns. In the upper grade the chief stress is laid on church history, which is developed from its beginning up to the present. In the highest class, one of the more abstruse books of the New Testament is studied, some important theological work is read, and ethical problems are discussed.

In the H. N. S. the course includes a study of the Old and New Testament (in Class III), the history of philosophy, religion and culture of the Roman Empire, the development of the Roman Catholic Church, the rise of monasticism, the separation of the Eastern from the Western Church, the Reformation, and the constitution of the Evangelical Church (in Class II) and the development of the Church in the nineteenth century (in Class I). In the practical year the work is largely in the method of instruction.

In the U. P. S. the course is the same as that of the last two or three years in the H. G. S.

The above courses are for Protestants. A course is also prescribed for Catholics, which is followed in Catholic schools. Catholics who attend Protestant schools are excused from religious instruction in the schools, but must receive instruction privately. In the case of Hebrews a special instructor is provided if there is a sufficiently large number in attendance.

German. The object of the course is thus defined: "to foster patriotism by a sympathetic study of the mother tongue; to enable students to speak and write the same correctly; and to acquaint the pupils with the most important works of the national literature."

In the H. G. S. the work is at first without books. Just when the actual reading shall begin is left to the particular school, but by the end of the first three years the pupil must be able to read the German and Latin text fluently. In the middle grade fairy tales, historical stories and poems are read, and a certain number committed to memory. In Class V there is an essay every four weeks. In the upper grade the reading is planned to give a general idea of the development of German literature, particularly of the Middle High German and eighteenth century classical periods. The following are some of the suggested readings: Selections from a metrical translation of the "Nibelungenlied," selections from Gudrun and specimens of the courtly epic, a longer work of Uhland, Schiller, Goethe, or Lessing, one of Shakespeare's dramas. Poems or selections are memorized. Together with the readings go the work in literature and metrics and the essay work. As a rule there are ten essays a year. In lieu of the essay they sometimes have a carefully pre-

pared translation from a foreign language. This is an excellent exercise for as a training in accurate expression and choice of words it is worth more than most essays that pupils write.

In the H. N. S. the work is of the same nature as that in the H. G. S., but more intensive: In Class III the history of German literature from the earliest times to Lessing. In Class II the works of Herder, Goethe and Schiller and of the Storm and Stress Period. In Class I the literature of the nineteenth century. From time to time reports on books read at home. In the practical year the work is largely pedagogical.

In the U. P. S. the work corresponds in the main with that of the corresponding classes of the H. G. S. and the H. N. S., but in the gymnasial courses Shakespeare's works are studied to a greater extent.

In the U. P. S. philosophical propaedeutics is taught in connection with German. In the earlier years the work is done incidentally in connection with a study of literary epochs and linguistic phenomena, but in the last two years special hours are given up to the subject. In these last years logic and psychology are studied.

French is begun in the middle grade with the fourth school year. The work here includes a short course in phonetics, practice in reading and speaking, the acquirement of a vocabulary, the memorizing of poems, and the singing of songs. The essential elements of grammar are learned, and there is written and oral translation into German.

In the upper grade the character of the work is the same. In Class II a modern comedy is read, and in Class I important works of the nineteenth century are studied. Instruction in literature and metrics is given in connection with the reading.

The practical work, both oral and written, continues through the entire course, becoming more and more independent till in the highest class the pupils write simple letters and make oral translation into French.

English is begun in the seventh school year and continues for four years. The nature of the work is the same as in French.

In the H. N. S. more stress is laid on phonetics so that the prospective teachers may become familiar with the way sounds

are produced. The characteristic literary productions are read, usually in selections, and the history of literature is taught in connection with the reading.

In the U. P. S. the nature of the modern language work differs only in the gymnasial course. Here instruction in grammar is restricted to the essentials and the chief aim is the ability to read the foreign language and to become acquainted with the literature and culture of the foreign people.

In the W. S. modern languages are elective. The nature of the instruction is the same as in the corresponding classes of the H. N. S.

Natural Science. The subjects studied are botany, zoology, chemistry, and physics. The apportionment of these sciences to the different classes may be seen from the programs of the various institutions. The aim of the course as stated in the regulations is "to impart a knowledge of the more important natural bodies and processes and to arouse an interest in nature and to enable the pupil to judge natural phenomena."

It will be impossible to give here a detailed account of the work and method of instruction, but one lesson that I heard in the seventh class of the H. G. S. (fourth school year) stands out in my memory as an illustration of the way that a good teacher can make a subject both interesting and instructive. The animal under discussion was the hare, which had been studied in a previous hour. By means of skillful questions the teacher had the class describe the hare in great detail, the nature of its teeth, its legs, how it defends itself, and finally the difference between a hare and a rabbit. This lasted about thirty minutes. The remainder of the period was devoted to a discussion of the deer, pictures of which were exhibited. I was so interested myself both in the subject matter and in the method of instruction that I was sorry when the period was at an end. As a rule the work in science is weak on the practical side, for many of the older schools have practically no laboratory facilities. In the newer schools, however, this is being remedied.

Needle Work is obligatory in the lower and middle grades of the H. G. S. and is elective in the higher grade of H. G. S. and W. S. The course covers instruction in both hand and machine work and is both practical and ornamental. I visited a number

of classes where the children were darning stockings, making pillow cases, and lace from patterns which they had designed themselves.

The course in the W. S. presupposes the course of the H. G. S. In addition to the regular course the W. S. sometimes has special courses for prospective teachers. These girls must pass a special examination.[1]

Geography, as is well known, receives much more attention in Germany than it does with us. Although it is a separate subject, it is nevertheless kept in close touch with the instruction in history and the natural sciences. It is taught as a whole, there being no formal separation of physical and political geography. The work begins in Class VIII with Heimatkunde, a study of the pupils' immediate environment, and continues through all the classes of the H. G. S. and the other institutions, covering the geography of the world.

In this work the text-book plays a very inconspicuous rôle; the principal factors are the teacher and the charts and maps with which each school is liberally supplied. The pupils have much practice in map drawing, but all this work is done in class as the regulations strictly forbid the assignment of maps as home work.

Kulturkunde is the rather indefinite name of a very practical and useful course in the Kindergarten Training School. The work is not scientific but popular, and has to do with the occurrences of daily life about which children are wont to ask so many questions. The sole purpose of the course is to enable the future mother or teacher to answer these questions. I attended one recitation in which the teacher discussed the subjects of heat and cold and of evaporation and condensation and the application of these principles to the phenomena of daily life. It was extremely instructive and the end to be obtained was never lost sight of as all the illustrations were such as a child could understand.

Domestic Science covers five hours a week for two years. Of these hours three or four are devoted to practical work in the kitchen and houshold department. As this is really the new part

[1] See Bestimmungen über Ausbildung und Prüfung der Lehrerinnen der weiblichen Handarbeiten. Berlin, 1908.

of the girls' school I spent considerable time in observing the work. The equipment is not elaborate, and the teachers complain of lack of space; but the work is thorough and seems well calculated to meet the ends for which the course is planned. It must be remembered that there are two classes of students in the W. S.: first, those who simply desire to prepare for the duties of a housewife, and second, those who expect to become teachers. A description of two different recitations will serve to show the nature of the instruction which these groups receive.

First, a lesson in housekeeping for non-teachers. The subject was illumination and vermin. Each girl had previously been assigned a subject. They discussed all sorts of lights from candles to electric bulbs with the methods of cleaning the same, and then took up the subject of household pests with the various methods of their prevention and elimination. This lasted for an hour when the girls drew slips of paper on which were written various tasks. They then went downstairs and each girl performed the task to which she had been assigned. The work was varied, ranging from floor scrubbing to the ironing of a lace handkerchief.

Second, practice work for prospective teachers. The teachers were girls from the highest class of the W. S. and the pupils nine girls from an elementary school. The teachers were divided into two groups, one for cooking and one for household work. The teachers first conducted a lesson as described above and then had their pupils do for themselves the work which had just been discussed. These classes are conducted on Saturday afternoon from four to seven.

Domestic Bookkeeping receives one hour a week for two years. The nature of the work may be seen from the following estimates, copied from one of the pupil's books.

On the basis of a certain income the students have to work out an account for each day for about twenty different items. At the end of the month the various expenses are itemized. A busy housewife would certainly not have the time to conduct such an elaborate system of bookkeeping, but it is a valuable school exercise and the girls learn something from it, for they were able to give me offhand very definite answers to questions concerning the cost of living.

SAMPLE HOUSEHOLD BUDGET
INCOMES, 1200 M., 3600 M.

No.	Items	%	Marks	%	Marks
1	Rent	20	240	18	648
2	Clothes	12	144	10	360
3	Food	44	528	42	1512
4	Heat and light	5	60	4	144
5	Physical improvement	4	48	4	144
6	Intellectual improvement	4	48	4	144
7	Insurance and taxes	4	48	5	180
8	Wages	—	—	5	180
9	Repairs and replacement of furniture	4	48	3	108
10	Minor expenses	1	12	2	72
11	Reserve fund	1	12	2	72
12	Savings	1	12	1	36
		100	1200	100	3600

Pedagogy is taught in the H. N. S. and in the W. S., the work in the latter corresponding to the first two years of the former. The object of the course is "to impart a knowledge of psychology and logic and of the theory of education and of teaching in their psychological development; to acquaint the students with the important educational ideals of the past and of the present; and above all to train warm-hearted teachers who appreciate the significance of education and are conscious of the responsibilities of their profession."

CLASS III. Psychology, study of the development of child life. Readings from Fröbel, Fénelon, Comenius, Salzmann, Keefer, Pestalozzi.

CLASS II. Psychology, logic, theory of education. Readings from Salzmann, Comenius, Pestalozzi, etc.

CLASS I. Theory of teaching, study of school problems, the legal status of women teachers, the higher girls' schools.

PRACTICAL YEAR. Under the oversight of teachers, the students give instruction from four to six hours a week in the practice school.

Latin is begun in the lowest class of the U. P. S. and continues for six years. The object of the course is "to enable the students to read the more important works of Latin literature and to appreciate Roman culture." The following course is outlined

but the substitution of other works for those suggested is left to some extent to the discretion of the teacher.

Class VI. More important conjugations and declensions. Once a week thirty minutes written work, which may be a dictation or a translation. This work is, however, not regarded as a test and no home preparation is demanded; all difficulties are explained in class. A beginners' book is used.

Class V. The time is equally divided between reading and grammar.

Readings: Selections from Curtius Rufus or Caesar.

Grammar: Review of accidence, chief rules of syntax, a study of the usual infinitive and participial constructions. Oral translation into Latin. Thirty minutes written work once a week. Short home translations.

Class IV. At least half the time is devoted to reading.

Readings: Selections from Livy and Ovid's Metamorphoses. Explanation of the dactylic hexameter. Memorizing passages from Latin poets.

Grammar: Review of preceding work and a study of modes and tenses. Oral work as in Class V. Thirty minutes a week of written class work, either translation or reproduction.

Class III. At least half the time devoted to reading.

Readings: A short oration of Cicero. Selections from Sallust and Caesar. Selections from Virgil's Æneid.

Grammar: Syntax. Written exercises as in Class IV.

Classes II and I. At least two-thirds of the time must be devoted to reading.

Readings: Cicero, De Officiis, Book III, Tusculan Disputations I and V, Somnium Scipionis. Selections from the Orator. A short oration.—Tacitus, Germania, chaps. 1-27. Selections from the Annals, Agricola.—Seneca, De Ira, De Clementia, Ad Marciam De Consolatione. Letters.—Horace, Selections from Odes, Epodes, Satires and Epistles.

Grammar: General review with especial reference to difficult constructions observed in the texts. Every two weeks a written class exercise (alternate translations from Latin into German and German into Latin.)

Greek, as may be seen from the program, has two more hours per week than has Latin. Due to this and to the fact that the girls have already had two years' instruction in Latin the reading of texts begins after four or five months' study of the grammar. The proposed course is as follows:

CLASS IV. A study of the Attic dialect to the μι verbs inclusive. Oral and written translations, dictations.
Readings: Selections from Xenophon's Anabasis or the Hellenica.
After the first four or five months the work in reading occupies three or four periods per week.

CLASS III. Reading: Plato's Crito. Selections from Herodotus and the first half of the Odyssey. [At least five hours per week.]
Grammar: Inflection, irregular verbs, syntax.

CLASS II. Readings [at least six hours a week]: Plato, Apology and a Dialog. Selections from Herodotus. Selections from second half of the Odyssey and first half of the Iliad. A tragedy of Sophocles.
Grammar: Review of inflection and syntax. Every two weeks translations from Greek into German and from German into Greek.

CLASS I. Reading [seven hours]: A longer dialog of Plato. Selections from Thucydides. Selections from second half of the Iliad. Two tragedies of Sophocles or one of Sophocles and one of Euripides. Selections from the Lyric poets.
Grammar: Review.

History is begun in Class VII in connection with German. In this year stories are told from classical and German antiquity and the commanding figures of Brandenburg and Prussian history are described. In the next year the character of the work remains the same but its scope is extended to include the great personalities from other parts of the world.

CLASS V. Chief events of Greek History to the death of Alexander the Great, and of Roman History to the death of Augustus. The Roman Empire and the spread of Christianity.

CLASS IV. German History from the first conflict of Romans and Teutons to the close of the Middle Ages. The

history of other countries in so far as it helps to explain and illustrate German History.

Class III. The Reformation and Counter-Reformation. Thirty Years' War and the Age of Louis XIV. Brandenburg and the history of Prussia to the death of Frederick the Great.

Class II. The French Revolution. The history of the nineteenth century, with especial reference to the rise of Prussia and the efforts toward social and political unity prior to 1871.

Class I. An intensive study of selected chapters from the world's history.

In the H. N. S. the course is as follows:

Class III. Chief events of Greek and Roman History. The Middle Ages to Charles the Great.

Class II. The political, legal, and social history of Germany from the time of Charles the Great to the death of Frederick the Great. A general survey of the intellectual and artistic development of the German people during this period.

Class I. The chief events of modern times from the death of Frederick the Great to the present.

Practical Year. A study of methods of teaching.

In the U. P. S. the course in Classes VI and V is the same as Classes III and II of the H. G. S.

Class IV. Greek History and Roman History to the close of the republic.

Class III. Universal history from the age of Augustus to the Thirty Years' War. German History to 1648.

Class II. Universal history from the age of Louis XIV to the present, with especial reference to the political and social history of Germany.

Class I. General review of periods previously studied. Intensive study of some particular epoch. A study of the social and economic conditions of the present time.

Mathematics. The purpose of the entire course is "to give the pupils sureness and skill in reckoning and a knowledge of mathematics which is based upon a clear understanding of its

leading principles. Further to accustom the pupils to logical thinking and to a concise method of expression." The courses prescribed are as follow:

H. G. S.

Classes X-VIII. Mental reckoning with numbers from 1 to 1,000. Written exercises in the four fundamental operations. Easy examples in the rule-of-three.

Class VII. The four fundamental operations. German weights, measures, and money. Practice in writing decimals. Easy examples in rule-of-three.

Class VI. Divisibility of numbers. Greatest common divisor and least common multiple. Common fractions.

Class V. Decimal fractions. Percentage and interest. Introduction of algebraic symbols for arithmetical numbers.

Class IV. Addition, subtraction, multiplication and division of algebraic quantities. Simple equations of the first degree with one unknown quantity. Introduction to plane geometry. Most important properties of the triangle.

Class III. Division and fractions (algebraic numbers). Factoring. Equations of the first degree. Further study of the triangle. Theory of the parallelogram and the trapezoid.

Class II. Equations of the first degree with two unknown quantities. Graphic representation of the function of the first degree. The simplest theorems of proportion. Theory of the circle. Pythagorean Theorem. Measurement of rectilinear figures.

Class I. Square root of arithmetical numbers. Simple equations of the second degree with one unknown quantity. Regular polygons. Measurement of the circumference and the area of the circle. Calculation of the volume and surface of simple bodies.

H. N. S.

Class III. Theory of powers, roots, logarithms. Equations of the second degree. Theory of similarity. Constructions.

Class II. Arithmetical and geometrical series. Compound interest and annuities. Equations of the second

degree with two unknown quantities. Introduction to the study of harmonic points, pencils, and transversals. Trigonometry.

CLASS I. A review of the whole course to this point. The binomial theorem for positive integral exponents. Stereometry.

PRACTICAL YEAR. Methods of teaching. Introduction to the literature of the subject.

U. P. S.

Oberrealschule Course

CLASS V. Equations of first degree with several unknown quantities. Proportions. Square root. Easy equations of the second degree with one unknown quantity. Theory of the circle. Measurement of rectilinear figures.

CLASS IV. Theory of powers, roots, and logarithms. Practice in logarithmic reckoning. Equations of second degree with one and two unknown quantities. Theory of similarity. Regular polygons. Measurement of circumference and area of circle. Trigonometry.

CLASS III. Equations of the second degree with two and more unknown quantities. Arithmetical and geometrical progression. Compound interest and annuities. Trigonometry. Stereometry. Harmonic points and pencils, transversals.

CLASSES II and I. Equations of third degree. Binomial theorem and the more important infinite series. Maxima and Minima. Review of all work thus far accomplished.
Conic sections. Spherical trigonometry as far as it is necessary to understand mathematical geography.

Realgymnasial Course

CLASS VI. Division and fractions of algebraic numbers. Factoring. Equations of first degree. Theory and construction of triangles. Theory of parallelogram and trapezoid.

CLASS V. Equations of the first degree with two or more unknown quantities. Graphic representation of the function of the first degree. Simple theorems of proportion. Square root of arithmetical numbers.

Easy equations of the second degree with one unknown quantity.
Theory of the circle. Measurement of rectilinear figures.

CLASSES IV-I. The work is in the main the same as that in the oberrealschule courses.

Gymnasial Course

CLASSES VI and V. Same as in the realgymnasial courses.

CLASS IV. Theory of powers, roots, logarithms. Practice in logarithmic reckoning.
Theory of similarity. Regular polygon. Measurement of circumference and area of circle.

CLASS III. Equations of the second degree with two unknown quantities. Transversals, Harmonic points and pencils. Trigonometry. Mensuration of triangles.

CLASSES II and I. Arithmetical and geometrical series. Compound interest and annuities. Binomial theorem applied to positive whole exponents. Review. Stereometry. Conic sections.

VI

THE TEACHING STAFF

The teaching staff consists of both men and women in approximately equal numbers. The new regulations demand that as a rule the number of either sex may not be less than one third of the whole staff. This same proportion obtains in the academic subjects of the middle and upper grade of the H. G. S.[1]

At the present time this proportion does not always exist for it is understood that teachers who were in service at the time the new regulations went into effect shall retain their positions, but vacancies which occur must be filled according to the new regulations of 1908.

For present purposes we shall assume that an institution has all the different departments. The teaching staff of such an institution consists of the following members:

1. The director or directress, the official head of the institution, who is responsible to his official superiors on the one hand and to the parents on the other.

This official is usually a very busy person, for in addition to his executive duties he must teach from eight to twelve periods a week. At the end of each year he must publish a report. These reports contain programs, lists of teachers, excerpts from the laws which govern the schools, tables of students, an address to the parents, a school calendar, and frequently a scientific treatise.

As an executive officer he does not seem to have quite so much to do as his American colleague and he is not constantly at the beck and call of parents. He has one hour a day when they may see him in his office and it is difficult to reach him at other times, for the entrance to the school is guarded by a

[1] One half of these subjects must be taught by academically trained teachers, and of these teachers not less than one third may be men or women.

porter who sees to it that no unauthorized person enters the building.

In boarding schools, which have a man at their head, there must also be a higher woman teacher who is responsible in all questions pertaining to strictly feminine affairs.

2. The higher (male) teacher, who gives instruction in the L., in U. P. S., and in the middle and upper grades of the H. G. S.

3. The higher (female) teacher of two kinds, academically trained and non-academically trained.[1]

4. The (male) teacher, who is not academically trained, who gives instruction in the H. G. S. but may not teach in the scientific classes of the H. N. S. nor in the four upper classes of the U. P. S.

5. The (female) teacher, whose duties and training correspond to those of the male teacher (4).

6. Primary (male) teacher, who may give instruction only in the lower grades and sometimes in the technical subjects of the middle and upper grades.

7. Primary (female) teacher, whose duties and privileges are the same as those of male teacher (6).

8. Teachers of Drawing.

9. Technical Teachers: (a) Needle Work; (b) Gymnasium and Swimming Teachers; (c) Domestic Science.

The members of the staff teach from eighteen to twenty-four periods a week, the older teachers having the smaller number of periods.

In addition to the regular work of instruction the teachers share in the oversight over the pupils in the various recesses. At such times there is a teacher in the playground and one in each of the corridors. The teacher in the corridor waits till all the classes are seated and the respective teachers have arrived.

Each class has its class teacher (*ordinarius*)[2] appointed by the director, who in a sense stands between the class and the director, and thus relieves the latter of considerable work. In serious cases of discipline he communicates with the parents;

[1] See chapter on Training of Teachers for the difference in their training.
[2] The same ratio of men to women obtains as is prescribed for the staff.

he grants permission for short periods of absence; and in the teachers' meeting at the conclusion of the year he recommends the pupils of his class for promotion. Once a week he has a consultation hour, when he may be seen by the parents of his pupils.

One half of the upper teachers may bear the title of professor, provided they have taught twelve years, reckoning from the conclusion of their second practice year. The title is purely honorary and carries with it no increase in salary.

VII

SALARIES AND PENSIONS

No school teacher is presumably satisfied with his salary, but the Prussian teacher in a higher school has today, it seems to me, very little reason to complain. He is in many cases better off financially than his American colleague, the college professor. He must, to be sure, wait a rather long time till he reaches the maximum salary, but while he is waiting he need not bother his head about the financial condition of the institution nor live in constant dread of spending his declining years in the poor house. As a servant of the state, and all teachers are indirectly state servants, he knows that the state will provide for him when he is no longer able to provide for himself. A realization of this fact gives him a feeling of security which the average American college teacher does not feel, and enables him to do his work calmly and patiently. I have seen quite a number of teachers at their work and in their homes and have been greatly impressed by the absence of that spirit of unrest, which is today such a characteristic feature of our American teachers. This is due solely, I believe, to the fact that the German teacher feels absolutely sure of his position and his salary and realizes that no amount of pushing on his part can hurry the slowly but surely revolving wheel of official advancement. I am not, of course, unaware that there is another side to the question, but contentment and calm are so absolutely necessary to the successful accomplishment of the teacher's work that I can not help feeling that the Prussian system is, on the whole, better than ours.

The following salaries are those prescribed for state institutions. No other public school is allowed to pay less. As a matter of fact, many of the city schools pay more. The salary of a private school teacher is fixed by the principal of the school.

Position	Initial	Salary in Marks after 3	6	9	12	15	18	21	24	27 years of service
1. Directors of complete institutions (i.e., H. G.S.+L.+U.P.S.):										
a) In Berlin.....	6600	7200	7800	+	1800 Rent allowance					
b) Elsewhere.....	6000	6600	7200	7800	+ 900–1800 Rent allowance					
2. Directors of H.G.S..	5200	5800	6400	7000	7600+900–1800 Rent allowance					
3. Upper (male) teacher	2700	3400	4100	4800	5400	6000	6600	7200	+ R.A.560–1200	
4. Upper (female) "	2000	2400	2800	3200	3600	3900	4200	+ R. A.560–1200		
5. Regular (male) "	2400	2800	3200	3600	3900	4200	4500	4800	+ R.A. 290–720	
6. Regular (female) "	1650	1900	2150	2400	2600	2800	3000	+R. A. 290–720		
7. Elementary and technical (male) teachers	1800	2100	2400	2700	3000	3300	3600	3800	4000	4200+ 290-790 R.A.
8. The directress of a H. G.S. must receive at least the salary of upper woman teacher (4)										

Every teacher in a school which is under state control receives a pension. The amount of the pension and the conditions of its payment may be seen from the following extracts from the laws:[1]

Every teacher who is incapacitated is entitled to a pension after ten years of service. If he is incapacitated before he has served ten years, he may receive a pension, provided his incapacity is due to illness contracted in the performance of his duty; otherwise he receives a pension only by the express permission of the king. At the age of sixty-five every teacher is entitled to a pension.

The amount of the pension is based on the entire income including rent allowance and is calculated as follows: between the tenth and eleventh year the pension equals $\frac{20}{60}$ of the income. It is increased each year by $\frac{1}{60}$ till the thirtieth year; from this time on it is increased by $\frac{1}{120}$ till the pension equals $\frac{40}{60}$ of the income, after which there is no further increase.

There is likewise a pension for widows and orphans. A widow receives $\frac{40}{100}$ of the pension to which the deceased would have been entitled if he had been retired at the time of his death. This sum ranges from 300 to 3500 marks.

Children whose mother is living and who at the death of the official is entitled to a widow's pension receive each one-fifth of the widow's allowance.

[1] See Güldner, p. 209ff.

Children whose mother is dead or who at the time of the official's death is not entitled to a widow's pension receive each one-third of the widow's allowance. The widow's and orphans' pension together must not exceed the amount to which the deceased would have been entitled if he had been retired at the time of his death.

VIII

THE TRAINING OF TEACHERS

It may be laid down as a general principle in Germany and particularly in Prussia that any person who is entrusted with a duty to perform must be trained for the performance of that duty. This principle is rigidly adhered to in the school. A German does not make use of the teaching profession as a stepping-stone to something better, but adopts it as his life's work. As may be seen from the schedule of salaries, Prussia has provided well for the teacher. In return the state expects and demands that the teacher be prepared to teach.

We are fond of saying that the teacher is the all-important factor in the school but we frequently belie our words by allowing practically anybody to teach, whether he is prepared to do so or not. In Prussia they not only say that the teacher is the all-important element in the school, but they prove the truth of the statement by compelling every teacher from the highest to the lowest to go through a rigid course of training before he is allowed to experiment on the youth entrusted to his care.

Let us now see just what training the different teachers have had; we shall discuss the matter categorically under the various members of the staff.

1. The *director* or *directress,* who is usually a higher (male or female) teacher, in which case he or she does not have to pass a special examination before being appointed to this position.

If, however, as is sometimes the case, a teacher who is not an upper teacher, should be appointed director or directress, then he or she must first pass the so-called rector's examination.

2. The *higher teacher* (*Oberlehrer*) at a Higher Girls' School must have exactly the same training and pass the same examination as the corresponding teacher in a boys' school. Since, after 1913, this will be the only way open to both men and women

who wish to become higher teachers, I shall go into the details of this training at some length.[1]

The examination is passed before one of the state examination boards, the members of which are appointed by the minister. It consists of university professors and secondary school men. For the examination of the individual candidate there is appointed a sub-committee. A majority vote of this committee decides whether or not the candidate has passed the examination.

The candidate must have graduated from one of the higher schools and must have studied at least six half years at a German university. In case he is to teach mathematics, chemistry, or physics, the regular course of a technical school may count for three half years of university study; if he is to teach modern languages a foreign residence may, by express permission of the minister, count as two half years.

The examination consists of two parts, a general and a special one, both parts being oral and written. The written examination must be taken first. In the general examination the candidate is examined on philosophy, pedagogy, and religion, and in the special examination he has a choice of practically all the sciences and languages.

There are two grades of teaching ability: first, the lower grade for the first six classes; second, the higher grade for all classes.

Two pieces of written work are given the candidate, one on some general subject and the other on some subject which he expects to teach in the upper grade. In case the candidate expects to be a language teacher the home task must be written in the foreign language. In case the candidate already has a doctor's degree, his dissertation may be accepted for one of these home tasks. A period of sixteen weeks is allowed for the completion of these tasks, which time may, upon application, be extended sixteen weeks.

In every special subject the candidate must pass a written test in the presence of an examiner. This test (Klausurarbeit) may not exceed three hours in length.

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[1] See Die Ordnungen für die Prüfung, für die praktische Ausbildung und die Anstellung der Kandidaten des höheren Lehramts in Preussen—1908.

In determining whether or not a candidate has passed both the oral and written examination are taken into consideration. He passes if he receives the mark "satisfactory" in the general studies and the mark "satisfactory" in at least one subject for the upper grade and two subjects in the lower grade. Upon the completion of the examination he receives the mark "satisfactory," "good" or "excellent." In order to receive the mark "good" or "excellent," he must have shown his ability to teach at least two subjects in the upper grade.

Upon the successful completion of the examination, the candidate receives a certificate. If he fails to pass he has another chance within two years. If he should fail to pass this second examination, he can have another chance only by the express permission of the minister.

The total cost of the examination is sixty marks. When the candidate has successfully passed all these examinations he is by no means yet a teacher. He must still have some practical training. This training which lasts two years takes place under the guidance of experienced school men and under the oversight of the Provincial School Board.

The first year of this practical work is known as the *Seminarjahr* and the second as the *Probejahr.*

A word of caution is necessary in connection with the term *Seminarjahr,* which suggests to us the thought of a seminary, as a separate school. In his first practice year the candidate does not go to a special school for teachers, but goes to some regular higher school where he receives instruction from the regular teachers of that school. Usually not more than six candidates are sent to the same school. The director of the school and certain teachers appointed for that purpose by the Provincial School Board are responsible for the instruction and training of the candidates. These teachers and the candidates, then, make up the *Seminar.* In this first year the candidate is made acquainted with the theories of education and teaching as far as they apply to the secondary schools. He likewise becomes acquainted with the methods of instruction in different subjects.

The second practice year (*das Probejahr*) is, as a rule, spent in a secondary school, which does not have a *Seminar* connected

with it. In this year the candidate puts into practice what he learned in the first year and teaches from eight to ten hours a week (without pay). If for any reason he teaches more than this he receives remuneration.

A number of teachers who expect to teach modern languages become exchange teachers and spend a whole or a part of their second year in a foreign country.

Toward the end of the second year the candidate must present to the director a report of his own work. At least three weeks before the end of the year the director makes his report upon the candidate to the Provincial School Board, who then decide whether he is prepared to teach. If they deem him qualified they give him a certificate; if not, they compel him to take another half or whole year's practice.

3. The *higher (female) teacher (Oberlehrerin)* (a) academically trained. This teacher has prepared herself for the university,[1] has studied there at least six half years, and must have exactly the same professional training as her male colleague(2). Subsequent to 1913 all *Oberlehrerinnen* will have to have this same training. At present there is in the girls' school another kind of *Oberlehrerin,* the non-academically trained.

4. The *higher (female) teacher* (b) has not the preparatory training for the university but only the normal school training. After teaching several years she decides to fit herself for the position of higher (female) teacher. Up to the end of the year 1913 such teachers may take the examination for higher women teachers according to the regulations of 1900,[2] the chief requirements of which are as follow: (1) She must have the right to teach at a H. G. S. (2) She must have taught five years. (3) She must pass an examination in two subjects. Her preparation, which covered five or six half years, was obtained in special extension course which were established for that purpose. As has just been said, this examination will remain in force only to the end of 1913.

In the future all higher (female) teachers must pass the higher

[1] Those at present in service were prepared at the gymnasial courses for women. In the future they will be prepared in the U. P. S.

[2] See Bestimmungen über die Oberlehrerinnenprüfung in Preussen nebst den Ergänzungen und Abänderungen vom 3 Apr. 1909.

examination described in 2 [i.e., pro facultate docendi] and according to the regulations of 1909 the ordinary teacher, who has had the training of the H. N. S. has the same right to pass this examination as the girl who has gone through the U. P. S. The requirements are briefly as follows: (1) She must have the right to teach in middle schools and in higher girls' schools. (2) She must have taught full time for two years in a H. G. S. (3) She must have studied at least six half years at a university.

It is assumed that the practical experience gained in teaching is worth as much as the purely intellectual training of the (boys) gymnasium or of the (girls) U. P. S.

5. *The regular (male) teacher (Ordentlicher Lehrer)* is usually a primary teacher,[1] who was trained in a normal school (for primary teacher) and subsequently took a second examination[2] and has also passed the examination for teachers in Middle Schools. The passing of this final examination gives him the right to become a teacher in a H. G. S.

This examination is both written and oral and covers: (1) General pedagogy. (2) Two of the following subjects: Religion, German, French, English, History, Geography, Mathematics, Botany, Zoology, Physics, Chemistry, and Mineralogy.[3]

6. *The regular (female) teacher (Ordentliche Lehrerin)* may be: (1) A primary teacher who has pursued the same course as that just described (5), or (2) a graduate of the Higher Normal School. She must pass at graduation the examination for teachers in Middle and Higher Girls' Schools and may at once receive her appointment. Her training may be seen from the program of the H. N. S.[4]

This teacher may subsequently become a higher teacher by pursuing the course described under 2.

7. The *primary (male) teacher,* who may teach in the lowest grade, has graduated from a normal school for primary teachers and has subsequently passed a second examination.[5]

[1] He may, in some cases, be a clergyman or a candidate for the higher teachers' profession (i.e., has studied at least three years at a university).
[2] See Kandel, pp. 83, 97.
[3] See Bestimmungen betreffend bas Präparanden-und Seminarwesen sowie die Prüfungen der Volksschullehrer, etc. Berlin, 1905.
[4] The examination is passed before a state examination board.
[5] See Kandel for details of his training.

8. The *primary (female) teacher,* who since Easter, 1909, receives her training in a special normal school, but who prior to that date was trained together with the girls who were preparing to become teachers in Middle and Higher Girls' Schools.

9. *Drawing Teachers* (male or female) must pass a special examination which is held once a year in Berlin, Breslau, Königsberg, Kassel, and Düsseldorf.[1]

The following candidates are admitted to the examination: (1) Elementary teachers who have a teachers' certificate; (2) men who have completed the first six years of a secondary school; (3) women who have completed the highest class of a H. G. S. or who have a teachers' certificate for handicraft, gymnastics or domestic science.

10. *Technical Teachers:*

Needle Work. Teachers of needle work must pass the examination for handicrafts.[2] Candidates must have completed the highest class in a H. G. S. or intermediate school or must have a teacher's certificate. The examination is first of all practical, including, for example, a test on the sewing machine, the mending of a torn garment and the embroidering of a monogram. In addition to the practical test there is an examination in the methods of teaching and finally an essay on some subject connected with teaching. In case the candidate does not hold a teacher's certificate this written test may be on some general pedagogical subject.

Gymnastics. These teachers are trained either in the state institutions at Berlin, Breslau, Königsberg, Magdeburg, or in private schools. The course extends over a period of five months and covers the following subjects:

Practical Exercises in Gymnastics (240 hrs.).
Anatomy and Physiology (60 hrs.).
History of Gymnastics (40 hrs.).
Method of Instruction (40 hrs.).
Study of Apparatus (20 hrs.).
Practice Teaching (40 hrs.).

[1]See Prüfungsordnung für Zeichenlehrer und Zeichenlehrerinnen, Berlin den 31 Januar 1902.

[2]Bestimmungen über Ausbildung und Prüfung der Lehrerinnen der weiblichen Handarbeiten und der Lehrerinnen der Hauswirtschaftskunde, Berlin, 1908.

At the conclusion of the course they pass an examination.[1] Candidates must be over nineteen years of age and must either present a teacher's certificate or else give proof of a fair education. The examination is both theoretical and practical. The theoretical test is usually an essay on some subject connected with gymnastics. The practical test is to show the candidate's proficiency in gymnastics and his ability to give instruction.

Domestic Science. The teachers of domestic science in the Women's School must pass the Gewerbelehrerinneneamen.[2] As preliminary training for this examination they must have had a course in one of the state Handel-und Gewerbeschulen for girls. They must also have six months' practical work in some big institution and one year of practice teaching in one of the aforesaid state schools.

When a girl graduates from the Women's School she may pass an examination, which gives her the right to teach domestic science in primary and intermediate schools. If she desires to teach in the Higher Girls' School she must pass also the examination just described.

[1] Prüfungsordnungen für Turnlehrer und Turnlehrerinnen, Berlin, 1894.
[2] See Flügel, Anhang, p. 10, 11.

IX

CONCLUSION

After years of patient waiting on the part of the champions of female education, after many bitter fights between the contending parties, after much careful consideration on the part of the government, higher education of girls has at last been made the business of the state and the higher girls' schools have been placed on a par with those of the boys.

Now that the girls' schools have been put under the jurisdiction of the provincial school board and the upper teacher's salary and rank have been adjusted one might think that the reformers had won a complete victory and would be content. A little investigation, however, reveals the fact that such is not the case. While all agree that conditions are better than they were previous to 1908, yet they have many criticisms to offer. It seems to be a general impression in Prussia that the present period is one of transition and trial and that other reforms must be made before the Higher Girls' School will fully meet the changing demands of the time. This may be true, but the situation as described in the preceding pages will prevail for several years to come for the government will not speedily sanction any radical changes.

It would be presumptuous in a stranger who has spent but a few months in the Prussian schools to criticize these schools from a Prussian point of view. I shall, therefore, in order to indicate the conflict of opinion which still prevails let two Germans speak, both of whom are in a position to speak with authority.

The case in favor of the new system is well summed up by Seehausen,[1] whose argument is as follows: The H. G. S. is left as a foundation with a ten years' course instead of nine. The new school seeks to train the reason by accentuating the reason-

[1] See *Päd. Archiv*, Vol. 50, p. 456.

forming elements in German and in the foreign languages, by introducing mathematics into the course, and by intensifying the study of the natural sciences. Too much mathematics is avoided, as there is an increase of only four periods in the upper grade. The course in natural science is increased by three hours; an hour in the gymnasium is added in each class in the upper grade; and instruction in drawing begins one year earlier, i.e., in the fourth school year. The H. N. S. avoids overburdening by increasing the course from three to four years and by separating the scientific from the practical examination. In the practical year eight hours per week are devoted to inciting the students to independent work.

Let us now look at the other side of the case as put by Wychgram,[1] who has the following criticisms to make of the present system:

1. The U. P. S. will be so expensive that only the largest cities will be able to afford them. Consequently people in smaller places, who desire to prepare their daughter for the university, will have to send them away from home, thus incurring a great expense.[2] The new regulations ought to allow girls to attend the boys' schools. That is, he favors coeducation and calls attention to the fact that this is permitted in the middle and smaller German states.

2. Graduation from a H. G. S. ought to be regarded as equal to graduation from a Realschule, then a girl could be kept at home till her sixteenth year, when she might be sent away to an Oberrealschule.

3. The program is overburdened. From the seventh class, i.e., from ten years of age the girls have more than thirty periods a week.

4. In some classes the task in mathematics is equal to or greater than in the boys' schools, although the girls have less periods for its accomplishment. With two of Wychgram's criticisms most teachers with whom I talked agreed, *viz.*, that the program is overcrowded and that the demands in mathematics are too severe.

[1] See Rein's *Encyclopädisches Handbuch*, 1910.

[2] At the present time one third of the students in the U. P. S. are not residents of the town where the school is situated.

A glance at the program will show that mathematics is a compulsory subject. Fortunately for the girl, however, who has no aptitude for it, a failure to pass in mathematics will not prevent her from advancing to the next class, for the system of promotion in the German school is different from ours. The pupil is not promoted or retarded on the basis of an examination but solely on the character of the year's work as recorded in the reports which are issued, as a rule, twice a year. There are five grades of work, "excellent," "good," "satisfactory," "poor," "unsatisfactory." As a rule, a pupil must receive at least "satisfactory" to be promoted, but a pupil who receives "unsatisfactory" in one subject may be promoted, if the teachers agree that she is able to do the work of the next class. A pupil who receives "unsatisfactory" in one of the so-called principal subjects must have at least "good" in one other principal subject in order to be promoted. The principal subjects are:

1. For the H. G. S. and H. N. S.: German, French, English, Mathematics, and Pedagogy (for H. N. S.).

2. For *Oberrealschule* Courses of U. P. S.: German, French, English, Mathematics, and Natural sciences.

3. For *Realgymnasial* Courses of U. P. S.: German, Latin, French, English, Mathematics.

4. For *Gymnasial* Courses of U. P. S.: German, Latin, Greek, Mathematics.

The "make-up" examination and promotion by subjects is unknown. The majority of the teachers decide whether a pupil is to be advanced. In the teachers' meeting at the end of the year the class teachers propose the members of their class for promotion and the teachers vote; in case of a tie, the director casts the deciding ballot. A pupil, who, after remaining two years in the same class, is still not promoted is forced to leave the school, provided the majority of the teachers decide that further stay there would be useless. In all such cases parents or guardians must be notified at least four months in advance that such action is likely to be taken.

Girls who complete successfully the course of the H. G. S. receive a certificate. Those who do not complete the work of

the last year receive only a statement of work completed with the further statement that they have not completed the course.

The examinations at the conclusion of the course in the U. P. S. and in the H. N. S. are state examinations, and are passed before state boards.

On the subject of coeducation there is no concensus of opinion, but the question is a live one. Every person with whom I talked asked my opinion on the matter and was eager to know how it is working in the United States. As a rule, the directors and the teachers of the girls' schools are not in favor of it, possibly for selfish reasons as their opponents suggest; but a large part of the public desire it and they are constantly keeping the matter before the attention of the government.

We know in America that there is such a thing as the woman movement but the subject is today not one that forces itself unpleasantly upon our attention. In Germany the case is different, for the German woman is just coming into possession of her rights and is beginning to play an important rôle in the solution of questions which are of vital importance to the welfare of the nation. There can be no questioning the fact that the women have been to a considerable extent responsible for the improvement of girls' schools and they are still hoping to effect other changes which will be to their interest. The woman teacher is not satisfied with things as they exist for she does not feel that she holds the place in the education of girls that is hers by right. She makes two claims, both of which are contested by the men: First, she demands equal pay for equal work. Second, she demands that women teachers should predominate in the girls' schools, particularly in the upper grade. The government made some concession on this point in the regulation which provides that not more than one third of the teachers in this grade shall be of one sex.

The Prussian government is alive to the economic rivalry which is already keen between men and women and even in the girls' school is trying to prevent further encroachment of women upon man's territory. With this end in view it, therefore, encourages openly the Women's School which prepares woman for activities in which she will not compete with man and seeks to discourage the University Preparatory School,

which prepares her for a career in which she will compete with him. In proof of this notice the regulation that does not as a rule allow the establishment of a U. P. S. where a W. S. does not already exist and further the constant extension of the W. S. Notice further the positive statement of the regulations that the government hopes that only the more gifted girls will enter the U. P. S. An investigation shows, however, that the hopes of the government are not likely to be realized. In fact the U. P. S. seems to be the fashion and the classes are already fairly full though the school has been in operation only since 1909. In ten years more there will be a tremendous number of women going to the university and then will arise the question of their subsequent careers. The government still asserts that the first business of woman is the home and with this assertion most sensible people agree but the fact of the matter is that one third of the women do not marry and they are no longer content to sit and wait for the husband that never comes. The employment of these women is a question which is seriously engaging the attention not only of the women themselves but likewise of the men.

Enough has been said to show some of the questions upon which the opposing parties do not agree. Let us in conclusion call attention to that part of the reform which is generally admitted to be a marked advance over previous conditions, *viz.*, the regulation which prescribes that after 1913 all upper teachers, whether men or women, shall have the same preparation as the upper teacher in the boys' school.

In my opinion the training of teachers and the improvement in their financial and social status is the most important thing in the German educational system and is the feature that we could most profitably imitate. If we see in this country a poor school building we may safely conclude that it is a poor school with poorly paid and poorly equipped teachers; but in Germany no matter how poor the building may be, the teachers all have the same training and receive a salary, whose minimum is fixed by an all-powerful government.

While visiting Prussian schools I saw some good teaching and some bad; I found some things done better there than here and some done worse; but the more I saw of teachers and the more

I learned of their training, the more firmly was I convinced that the one thing that we can learn from Germany is that the teacher must be prepared for his work and when he is prepared he must be secure in a position where he receives an adequate compensation for his labor.

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INDUSTRIAL ARTS EDUCATION AND INDUSTRIAL TRAINING

By Frederick H. Sykes

Director of Technical Education (Schools of Industrial and Household Arts), Teachers College, Columbia University

I. The Problem Stated

The vitality of the public education system of the United States is receiving ample demonstration in the adjustments and extensions it is now everywhere making to incorporate the ideas and programme of industrial education. Educators realize that systems if vital must change, must grow, must specialize; and our system of education is fortunately so vital and responsive that it is ready to develop to meet the new demonstrated needs.

Education, we realize, is not the fixed thing that some people would have it. It has never been a fixed thing. It must seek to meet the demands of life, and every age has changed its material of education, and changed it under the pressure of the changing nature and demands of social and economic life. To-day, over this whole continent, education is seeking, too slowly, perhaps, to adjust itself to the life of our own time, the life of a great industrial community; the curriculum of ten years ago is obsolete, or ought to be, to-day. The adjustments that have taken visible form in the work we call manual training, domestic science, domestic art, and so on, at first seemed to be merely a demand for "the practical" in education; they are now seen to be a clearer recognition of right method in education, of the

facts and values of child development, and of the shortcomings of our educational system. That is what lies behind the new education to give it what we begin to realize is a revolutionary force.

The root of the matter is that the public school system of the United States is not adequately efficient as an educative force. For reasons of faulty administration, indifference of parents and children, lack of adequate motive in instruction, the hardship of economic conditions, the public school system does not yet reach and hold the children it is provided to instruct. Even where it is best organized and administered, say in cities with a population of 25,000 or over, approximately half the children who enter are scholastically dead at the end of the seventh grade; a third of them enter the high school, and about one-twentieth actually graduate.

To put this generalization more definitely: Professor Thorndike[1] has shown that, in 1900, in cities of 25,000 and over, out of one hundred eight-year-old pupils living long enough, the number retained till any given age is as follows:

School Longevity—Per Cent

Age	10	11	12	13	14	15	16	17	18
Per Cent	100	98	97	88	70	47	30	16.5	8.5

School Mortality—Per Cent

		2	**3**	**12**	**30**	**53**	**70**	**83.5**	**91.5**

During the last ten years we have increased the school longevity up to the fourteenth year by about five per cent.[2]

This showing is the more unsatisfactory because of the grade of instruction with which the "eliminated" pupils leave school. A considerable percentage of pupils are retarded in the normal annual passage through a given grade, so that many pupils who leave at thirteen, fourteen, and fifteen have not got beyond

[1] *Elimination of Pupils by Schools.* Bulletin No. 379 of the U. S. Bureau of Education. By E. L. Thorndike.

[2] *Age and Grade Census.* Bulletin No. 451 (No. 5, 1911). By George D. Strayer.

the fifth, the sixth, or the seventh grade respectively. Professor Strayer finds that the ratio of pupils in the sixth, seventh, and eighth grades to those entering school in a given year is 73, 55, 42 respectively. The percentage completing the grade is naturally smaller. The total result is that over half the pupils in the cities of the class investigated leave school with less than a full elementary education. When we consider that these statistics are based on school systems in cities with conditions most conducive to scholastic longevity, we may be safe in concluding that the country as a whole will make a worse showing than is here stated.

This school mortality is due, in part, to economic pressure, though less so than is currently believed. The main reason is that the material, method, and direction of elementary education repel all pupils whose aptitudes and interests differ from those of the orthodox schoolroom, and repel them in increasing numbers as pupils grow in consciousness of their powers and likings.

The truth is that the material and method of our instruction are still predominantly abstract, and need to be made more concrete, more real, more vital. Our public school curriculum is still predominantly the product of a philosophy and an economic system (of which I shall speak later) that are both out of date. To separate the child in school from all his natural activities and environment, to train him through abstractions, chiefly to interpret and use symbols of reading, writing, and arithmetic, to teach subjects of instruction, not as related to the child's mind or life or future vocation, but after an order or classification of their own—that is the school practice which modern school reformers have not yet succeeded in breaking down. The kindergarten, the manual training movement, the household arts movement, the vocational education movement have all been powerful centres for the diffusion of new conceptions of methods and material of elementary and secondary education. The older practice is, it is true, somewhat modified, but in the main it still persists.

The result is that the child is still largely sacrificed to the curriculum. The progress of the child is determined by graded stages of abstract studies, so constructed that the interests of the

lower grades are subordinated to the higher, and at the end thereof the needs of the college dominate the whole. The new education demands now for the child that his whole life shall be taken stock of; that education shall concern itself with all his nascent powers, realizing that children are as diversified among themselves in abilities, occupations, aptitudes, tastes, as men and women are among themselves; that the school life of the child shall be his fullest and best life, guiding, prompting and lifting his developing personality in its best representative activities; that at each new grade the education of the child shall be considered afresh, and children taught to do and make and know what they then really want to know and make and do. The new education would trust a little more to the child's irresistible impulse of imitation and invention, and a little less to the schemata of the mathematician and grammarian. It holds, in short, that school life should be less formal and more vital, more organic, leading through interest to efficiency.

The need of efficiency as distinct from proficiency has brought on the present movement of vocational training. American public education, we admit, has not yet in any broad and adequate way concerned itself with vocational training. Its ideal has been a certain conception of culture possible to all children. That symbol learning took a supreme place in this ideal was owing doubtless as much to a desire to get a lowest common measure of subject matter as to the continuing tradition of humanistic education. When trades were taught in the trades, the learning of the book, commonly regarded, in spite of many protesters from Rousseau to Ruskin, as education, was a supplementary matter, useful and broadening, no doubt, and above all giving prestige, but in the practice of livelihood, incidental. On this basis, with a certain aloofness from the occupations of men and women, devoted at its best to things of the intelligence and the spirit, the public elementary school, free, universal and obligatory was founded, and on the basis of the day elementary school the day secondary school was subsequently developed. If the idea arose of the relation of education to life and practice, it remained a narrow idea, fitting only the few and exceptional, children for the most part of the well-to-do, destined for the colleges and professions; the many who were not of that class

kept slipping off the ladder, disappearing from the school register, with only the requiescent inscription of "gone to work." We realize now that in practice something interferes with the success of a scheme, in the abstract so perfect,—that offers the child virtually free education from his sixth to his eighteenth year, and that ends as we have seen with half the children gone after the middle of the game and nineteen-twentieths by the end.

This educational system so constituted, the world is now questioning, with increasing insistence: *Do you prepare for life and livelihood?* And the system, uttering inconsequentialities about discipline and culture, ends by owning that *It doesn't, never did, and never was meant to.* And yet the primary question with every man is livelihood. Can we not recognize the worth and dignity of vocational purpose in education, in which is an asset of the highest educational value? Can we not realize also that in the present economic system children must at an early age begin to earn their living and that this necessity does not lessen the obligation of public education for their training; but that for these and for all we must plan and provide with even greater care than we plan and provide for the few who now alone continue at school.

For these reasons: the falling away of school attendance, the abstract instead of the concrete approach in school method, the subordination of the child to the curriculum instead of the curriculum to the child nature, the lack of vocational training—a criticism is being applied to the product of our system of public instruction such as heretofore has never been applied. We ask to-day: Does our public education give us in any adequate measure social and industrial efficiency? And the answer comes from all sides—from every grade of life and calling—that our public educational system is lacking: it does not adequately make for faculty—for the intelligence, power and will to do things, and it does not make for efficiency, which is that faculty trained for the particular needs of a complex civilization.

II. The Programme of Industrial Education Stated

This state of affairs, we hold, is deplorable, and, because it is capable of remedy, should be cured. On the one hand we

must hold more children at school by offering a more real education—instruction that enlists interest and attention—the basis of mental growth. On the other hand we must differentiate the types of education to provide vocational education. The changes being or to be made, which constitute the programme of the new education, are briefly these:

I. The revision of the elementary school studies in material and method to provide for the full recognition of the constructive and artistic activities of children; to use and train mental activity with respect to science, tools, machinery, processes, in preparation for the modern world they are to take a place in; to cultivate an appreciation of the domestic and the industrial, or commercial, or agricultural environment of the child's life—the great realities that surround him.

II. The differentiation of the secondary school to provide, as fairly and adequately as we now provide collegiate preparation, courses of instruction for such as will enter the field of agriculture, or commerce, or the scientific or mechanic arts, or the home.

III. The provision in public education for vocational training as fully and freely as we now provide any other type of secondary education and as diversified as the local community life demands.

This vocational organization shall take cognizance of economic facts and industrial needs and be ready to meet conditions by happy adjustments, operating by day or night, now through trade schools, again through co-operative and continuation schools, through monotechnical, or polytechnical, commercial, agricultural, art-industrial schools.

Not to encroach on but to revise this public school system, not to weaken its ample elements of good, but to strengthen and vitalize them, not to diminish the scope of public education, but to enlarge and diversify that scope—such is the purpose of the new movement that is named industrial or technical or vocational education. For American public education it is nothing short of the discovery of another hemisphere of educational activity.

Let us consider this programme in its broad aspects:

III. Industrial Arts Education and the Elementary School

The present state of national education is a natural evolution of the type idea in which our state systems started. The public elementary school began in the United States before the advent of the railroad and before the factory had made over the conditions of industrial education. The apprenticeship system, admirably suited to the small shop, the agricultural system with unlimited supply of free land, provided easy and natural means for sons to acquire callings they saw everywhere practiced about them. The boy got his feeling for industrial life from the near-at-hand. The blacksmith shop, saw-mill, grist-mill—they were daily realities to him. The miscellaneous activity of artisans in rather isolated communities called out that all-round knack and handiness that characterized the old-type American mechanic.

Education meant merely a supplementary thing, to be got before the serious training for vocation began. It did not need to concern itself with vocational education—that was provided in the steps of the vocation itself. It offered a general and supplementary training only slightly related to the vocations. Thus there was a balance and a measure of completeness in the total result that tempts one to regard the last generation of workmen as a very fine type of industrial manhood.

Our public school system has thus been constructed and developed on two suppositions—one, that vocations could be learned adequately in the vocations, and therefore public education had no concern with vocational training. The second supposition was that the best, or only possible, training given by the state was a general academic education. Accompanying this was the secondary supposition that a school system that provided the pupil in day-time hours with free education, from his sixth till the eighteenth year, fulfilled the whole need and duty of the community in the matter of instruction.

To establish such a system was a generous and honorable provision of which the nation may be proud. But to-day both suppositions, in our present economic conditions, are, if not false, in so small part true, that an educational system like that of the United States, based on them, is, with regard to the training of the nation and the realizations of education in other countries, both inadequate and in a large measure misdirected.

The question concerns first the elementary school. In recent years the most vital changes in material and method of instruction in the elementary school have come from the ideas and methods of industrial arts education. Elements of industrial education are already in elementary schools of the better type—drawing, clay modelling, wood working; something done in physics, nature study, commercial geography; here and there we find metal-working, dressmaking and cookery, and would find them in all schools, probably, if people would stop thinking of education as expense. Education, real education, it should never be forgotten, is not expense, but investment.

These elements are already in many elementary schools; but many people are at sea in the bearings of the whole matter; as some one has phrased it: the idea of industrial education is to put blisters on the hands instead of on the mind. The basis of the new education is very different. The true basis for the new education in the elementary school lies in the nature of child thinking, Child thinking is essentially objective. It prefers seeing and handling a thing to mere talking about it. It prefers doing the thing to mere hearing about it. That is a principle, also, for much of our higher instruction—the laboratory and shop method of science and engineering. But it is the indispensable method in childhood and in the education of the child. The child thinks most when he plans what he is interested in doing.

The presence of subjects of industrial arts in the elementary schools is determined by this and many other reasons. In the first place they offer the concrete as the basis of study—the most favorable teaching material and the best approach to abstract knowledge. Then, they offer the opportunity for constructive activities, mechanical and artistic. Again, they offer a natural centre of correlation of many school subjects; arithmetic and geography, for example, get more definite content by association with industrial arts subjects. They offer, too, the natural introduction, historical and social, to the life of an industrial community to which the pupil belongs. The average natural aptitudes and interests of the child find expression here, as, at this stage, they find expression in no other subjects; they test aptitudes hitherto neglected.

The old education worked essentially with the abstract. Spelling was and is but conventional forms, reading was but words, geography but names and space relations. In our new education we aim to hold fast what is good in the old, but also to bring into every elementary schoolroom from the first primary grade on, material of the concrete—the daily realities of the child's life and thought. We choose primary materials—foods, textiles, clay, wood, metal—the basic materials of industrial use—as the materials to talk about. What a world of knowledge, of history, of invention, of art, of manufacture, of commerce lies there exciting the child's interest. We use the basic processes of industry, as modelling, wood-working, metal-working, weaving, sewing, cooking as the projects for the child's activity. We are not afraid to deal in hygiene when food is involved, or nature study or commercial geography when wood or wheat is mentioned. And we teach drawing, the A, B, C of all the arts, and design where we can apply art to projects.

Thus we inculcate habits of industrial thinking and practice on what concerns the child. We use that love of tools and tinkering and doing things—instinctive, God be thanked!—in every boy and girl,—that wonderful curiosity about the world, opening up everywhere about the child, wonderful beyond Aladdin's palace.

I have a vision of an elementary schoolroom. It is not by choice the vision of the schoolroom of my own childhood,—the formal rows of seats, the bare ugly walls and windows, the languid youngsters, droning over abstractions, under the guidance of an antiquated, 'acidulous vestal.' It is rather the vision of schoolrooms that make you think of the corner of a brick-yard, kitchen, sewing-room, foundry, blacksmith-shop, carpenter-shop, aquarium, terrarium, herbarium, library—the windows open on the school garden, and the teacher—well, someone who can do things.

At this time we need experimentation in education. We have had thousands of schools working on the basis of formal studies; we need now to test the new method by elementary schools that are put frankly and fully on the basis of concrete and constructive studies with the formal studies related to them and approached through them. He who heareth the word and doeth it, buildeth his house upon a rock.

That is the pedagogy of the question. There is also the practical end of the new education. It offers an adjustment of the school to life. Surely insight and experience in industrial conditions are obligatory in all who dwell in an industrial world.

Other nations see that: household and industrial arts are a part of the curriculum of every other civilized nation. Every modern European nation makes domestic science and domestic art—foods and cookery and houshold management, sewing, repairing, garment-making,—an integral part of elementary education. The most advanced nations make wood-working and metal-working, physics and chemistry a part of public elementary education.

There is no longer any question over household arts in the elementary school. What was thought at first a fad has become a fixture. Here in America our household arts education shows how our schools can face the hardest task now put upon the nation. In the home the standard of life is going up—the preparation and variety of food, the sanitation of the house, style in dress, the decoration of the home,—and hired help is impossible. The children are being taught to do their share. A stamp of worth has been put upon service in the household by teaching household arts in the school. Mothers have now less need to sacrifice themselves, standing between the children and housework to get for their children more time for the school work. The school can now contribute its part to the efficiency of the home by diffusing ideas of hygiene, sanitation, and domestic economy: the efficient home can contribute to the preparatory industrial training of the children by having them interested workers in the household. Make this form of the new education universal, and we shall have improved the standard and lowered the cost of living throughout the nation.

In the same way the industrial arts subjects are a preparation for industrial life. They are not a trade preparation so much as a preparation of the understanding, the spirit, the habit. They cultivate familiarity with tools, the mental and physical co-ordinations called for in all industrial manipulation; they develop industrial intelligence and lend dignity to labor. They are the means and the only means now available for diffusing an interest in form and color, in a word, in beauty; and so

through them we can do something to remedy that incredible lack of taste that marks a nation that has lost the traditions of art in all its industries.

Such subjects to be adequate must be guarded against two dangers—lack of content of ideas, which manual training has suffered from, in restricting shopwork to manipulation; and the prevalence of caste conceptions of propriety by which all girls are assigned to needlework and all boys to bench work. The tools should be to those that can handled them.

IV. Industrial Arts Education and the Secondary School

A percentage—estimated as high as forty—of the pupils of the elementary school enter the high school. Is our high school education all that it should be? Revolution is now beating on the walls of every high school in our land. During the last two years thirty-two high schools of New York State have differentiated from the old-line type and put in household arts, agriculture, and shop work into their curriculum on a par with old-time subjects. But the old-line type is still the predominant type everywhere. No matter what the interest or destination of the pupil, whether the high school is in a farming, or a commercial, or an industrial community, the high school in the main is still the machine of the College Entrance examinations—hide-bound, even if the binding is literary morocco. The high school should prepare for college. It is a necessary type, and I would not sacrifice one of the types of education that we have; hold fast that which is good. We should educate for college those who will go to college—even if the percentage is but six; but we should educate also for life and livelihood those who must soon earn their living.

We want not one type but at least six types of high school courses—schools that are in key with their environment—that look to college and to technical schools, to agriculture, to commerce, to industry, to home economics.

In the second paper of this series, Professor Bonser takes up the modifications of our present school curriculum with special reference to industrial training, and the history and pedagogy of the movement are given there a special consideration.

V. Public Education and Industrial Training

That public education should concern itself with vocational training is a proposition easy of demonstration. In the first place, it is the natural evolution of public education. Specialization and complexity or intensification are the marks of evolutionary progress. This progress appears in all phases of industrial and social life. The family, once an industrial as well as a social nexus, has lost nearly all its industrial occupations to the shop, the factory, and the store. The primitive farm has specialized and grown intensive and complex in narrower fields with the dairy, truck, fruit, or grain as the objective. The metal-working trades, the outgrowth of simple blacksmithing, have become infinitely diversified, employing a host of specialized workers and an innumerable array of special machines. The manifold social activities of the Church, in teaching, healing the sick, caring for the poor, have resolved themselves in many cases into specialized activities in public educational systems, hospitals, asylums, entirely free from the institution by which at first they were mothered. The whole movement of a national economy moves up from producing raw materials to producing also manufactures, from crude manufacture to fine, from life on a primitive plane to the complexities and interrelations of highly organized civilization.

Should our public educational system share in this evolutionary progress? Should it differentiate and specialize to meet the needs of the industrial community it purports to serve? Or, should it continue to treat the child as it for the most part has hitherto treated it, as a being, spiritual, absolute, isolated, to be developed mainly by abstractions to some idealistic destiny?

In the training offered for professional careers, education has already specialized. The professions of teaching, the church, medicine, including surgery and dentistry, law, engineering—mechanical, electrical, and chemical, military and naval science, agriculture, are all to-day entered best through schools, and these schools are with the exception of the church, unless otherwise provided by private-public foundations, founded and administered by the state or nation. We take this kind of specialized education, though almost every type is comparatively recent, already as a matter of course. The responsibility of the state

for technical education to meet all industrial needs has been so long acknowledged in practice by advanced European nations that Europe takes this part of the state's duty now also as a matter of course.

Private initiative in the United States has already provided a measure of specialized training in institutions such as business schools, schools of applied design, of mechanical and domestic arts. It is a law of institutional growth that private initiative in education is the forerunner of state action. What has been done sporadically, chiefly for private gain, can by the state be done broadly and for the public good.

The basis of a plea for universal industrial training by the state is that such training is the greatest factor in industrial efficiency and that no other organization can adequately furnish it.

Our dependence on private initiative for education for practical efficiency has resulted in vast areas of inefficiency; in training we are behind Europe and behind our necessities. Our public press teems with interviews, reports and articles to the uniform effect—our farms are badly worked, our food is badly inspected, our artisans are inadequately trained, skilled foremen are hard to find, and the scrap heap is too big; our wares in innumerable articles of commerce are beaten in the world market: the problem of living—the totality of it all—cries out from every home in the land—in this land, the most favorably placed for comfort, health, good government, under God's sky.

The thing we lack almost everywhere is efficiency; or, if we get it, we get it at too great a cost. Now three-fourths of this matter of efficiency is training, that is, applied education. In the professions we realize that. In the professions we have already manifested our faith in works—we have our highly efficient schools of medicine, surgery, pedagogy, engineering, art, architecture, military science, naval science. They have given us efficiency in the lines intended. It is obvious now to expect efficiency through schools and institutions in our teachers, physicians, surgeons, architects, engineers, officers of the army and navy; it is equally obvious that we might expect to promote efficiency in all other workers by education—in our farmers, our artisans, our foremen, designers, salesmen, build-

ers, in our homes, and in our municipal administration. Think of the question of municipal administration. Every city in the land is fighting for decent administration and cannot get it. Hundreds of thousands of dollars are spent in every great city at every election in a vain effort for reform. We have not yet one school of municipal administration in the land; some day we shall train municipal officials, and the result will be worth notice.

We cannot get efficiency without training. That is one of the obvious things we don't see. Efficiency has come to mean to-day a very complex thing, and the training for it a very complex thing. The Industrial Revolution absolutely wiped out the old hand-industry as a commercial factor. It harnessed the steam-engine to the spinning-wheel and the loom, and one man plus the machine does the old work of hundreds of hand-workers. It harnessed the steam-engine to the cart and carriage and boat, and brought the wheatfields of Russia and North America nearer London than was Yorkshire. And great industries like agriculture, shipbuilding, paper-making, refining of sugar or oil—have been revolutionized by the application of science. Other industries—the building industry in its higher forms, furniture making, printing, textiles, ceramics, involve the application of art in highly specialized forms, and the tradition of art disappeared with the old hand-worker. Modern industry, then, is refounded on the application of the machine, of science, and of art and organization to production.

The old apprentice system with its close relation of learner and craft-master, in which the master's obligation to teach was enforceable by law and penalties, did well in hand-industry and the master's workshop. But the factory system altered the relationship, and in the adjustments following the spread of the factory system, the employer's obligation to teach has somehow got lost in the shuffle. And yet the need for trained intelligence, knowledge of machinery, of science and art, has kept rising with every advance and specialization of industry. What must education do? On the one side at present we have general academic education, on the other side we have specialized pursuits which the learner must pick up as best he can. Between the education of the school and the specialized pursuit

there is no connection, no bridge. And the bridge that is needed is specialized industrial education.

Abroad they have a wider eye to the economic value of specialized education and do things differently.

Abroad, we see training and efficiency go hand in hand. In the countries where technical education is most highly developed efficiency strikes you at every turn: the cleanliness of the streets; the even, quiet movement of the street-cars; the perfection of machines; the artistic lines and durable construction of the houses, the beauty of the stained glass, the quality and design of the linoleum you walk on; the planning of city extensions, of garden cities; the wealth of industrial countries like England, Belgium, France, Germany, the revival of Italian commerce. In Italy, the movement of technical education is now turning the convents and palaces and fortresses of the middle ages into art-industrial schools and museums. In Prato you pass from the work of Donatello and della Robbia to the vital life to-day, under new conditions of industry, of the Profesional School of Dyeing and Weaving. In the Castello of Milan, once the stronghold of the Sforzas, now reign the school director and the curator. You get the conviction driven home and pressed in, that behind all that you see and experience, behind the whole movement for the betterment of the nations wherever you go in Europe, *the new directing force is technical education.*

On the one hand there is the striving to create and apply beauty to industry; on the other to increase efficiency in every line of production. And the total result is that mere living itself is better organized, is moving to a higher plane.

Education abroad has specialized to meet conditions. Every state—Germany, Switzerland, Holland, Belgium, Scotland, Ireland, England, Austria, France, Italy—looks upon this vocational training as a public obligation, as much an obligation as public elementary or public secondary education. And they put it as a rule not in charge of the Minister of Education, but the Minister of Trade, Commerce, and Agriculture. And this education is already in the main universal and compulsory, or is getting to be as rapidly as ministers of trade, commerce and agriculture can make it. So they adjust education to the present demands of life and economic conditions.

Everywhere in Europe technical education is regarded as an essential factor in industrial efficiency. To develop a new industry or to revive one that is languishing they institute schools for the industry. We raise the tariff; they raise schools. The Swiss make the most perfect watches; the oldest technical trade school is said to be the School for Watch-making of Geneva. German chemical industries lead the world; the dyes of the textile industries, the colors of the artist, the inks for fine printing, especially color-printing, are German: Germany has over six thousand school-trained chemists in her chemical industries. The industrial rehabilitation of Italy is accompanied by the parallel establishment of technical schools, for the soap industry, for the paper industry in Milan, for the textile industry at Prato, for the art industries at Rome, Florence, Venice, Milan, for mechanic arts in every important town. But Germany is the most remarkable example among all the nations, of the immediate economic benefits of specialized education applied to the needs of a newly developing nation.

The evolution of Germany as an industrial nation of the first rank has come about virtually in our own day and generation. What are the factors in this evolution? The soil of Germany is not naturally rich nor is her coal of the best quality; but her technical schools are. In the matter of education for industrial purposes Germany has been able to think socially and nationally. She learned industrial processes from Great Britain; she borrowed the idea of technical schools from France and Switzerland. On the basis, first of evening drawing schools, she built up her education of the artisan. Not abandoning the system of apprenticeship, she met new conditions by increasing the training offered by the state as the training offered in the trades decreased. To-day it may be said that throughout the length and breadth of the German Empire the state offers all the technical instruction supplementary to the trade, needed in all vocations—whether it is the design of the stained-glass worker, the chemistry of the dyer, the bookkeeping (business practice) of the shoemaker, the French of the hotel waiter. Every apprentice, boy or girl, from fourteen years of age, is in state-directed schools for from six to eleven hours a week throughout the years of his apprenticeship; and his certificates as journeyman

and as master craftsman are issued according to state standards, by the state. A city system of industrial education such as Munich covers the courses suited to sixty-seven trades, while that of Berlin provides for two hundred and twenty-three trades. And this education is not merely technical, it includes the hygiene, the civics and the law that concern every workman as a man and a citizen. The way of the school superintendent in Germany is not simple, but then he is free from politics.

As the state looks after the artisan and housekeeper, so it provides for the master workman, the foreman, the manager, the contractor, the builder, the expert technician, the chemist, the designer, the draftsman, the salesman. Germany has state schools for the ceramic industries; schools for the higher woodworking industries; for the building trades; for the textile industries; for mechanical and electrical engineering trades; for the chemical industries; for watchmaking, shipbuilding, soap, paper, optical instruments, hotelkeeping, automobiles, beer. They serve as day schools for experts and part-time day or night or Sunday schools for the apprentices.

The provision for art industrial education is almost as marked as the provision for industrial education. There are thirty-four art-industrial schools of the first grade. These schools have size and equipment adequate to the immense field of art applied to industry. We have no building for art-industrial education in all the United States to compare in beauty and extent with the Art-Industrial School of Berlin or of Dresden. The Academy of Graphic Arts of Leipzic embraces all the trades that centre in the production of the printed paper and the book; it has the dignity, the equipment and thoroughness of our best colleges and schools of engineering. The School of Photography of Munich (Lehr-und Versuchsanstalt für Photographie, Chemigraphie, Lichtdruck, und Gravüre) rivals the Leipzic school in the thoroughgoing intelligence of its organization, in completeness of vision and equipment for its peculiar field.

To supplement these schools with demonstration material they have industrial and art-industrial museums like the Deutsches Museum and Bavarian National Museum of Munich, museums that every city seeks to possess and enrich, for which money

and brains have been spent like water, that are revelations of beauty and interest, the stimulus of the students of the adjacent schools.

The provision for commercial education is equally widespread and thorough and equally well graded and organized.

And beyond these for the highest training of the engineers and commercial experts are the technical universities (technische Hochschulen) and commercial universities.

Here is the table of the German system,—based in the main on Dr. Rose's voluminous reports.[1]

HIGHER TECHNICAL EDUCATION	[UNIVERSITIES ..... 22] TECHNICAL UNIVERSITIES ..... 11 COMMERCIAL UNIVERSITIES 5	Application of highest scientific knowledge to the purposes of the industrial arts.
MIDDLE TECHNICAL EDUCATION	SCHOOLS OF: Agriculture ..... 11 Art–Industries ..... 34 Building and Engineering Trades .... 52 Ceramic Industries ..... 4 Commerce ..... 429 Forestry ..... 5 Metal Industries ..... 12 Mining and Metallurgy (Prussia alone) 10 Naval Architecture and Engineering . 2 Navigation ..... 19 Ship Engineers ..... 8 Textile Industries—45 (higher), 58 (lower) ..... 103 Woodworking Industries ..... 12 MISCELLANEOUS SCHOOLS—Basket-makers, glass-stainers, bootmakers, photographers, tailors, musical instrument makers, toy industry, millers, book printing, innkeepers, gilders, ivory workers, cabinet makers, special instrument makers, tanners, etc.	For technical experts, foremen, superintendents, owners, managers, salesmen, etc.
LOWER TECHNICAL EDUCATION	CONTINUATION SCHOOLS (FORTBILDUNGSSCHULEN) Universal and in general obligatory throughout every community of the German Empire ..... 13,652[2]	For apprentice artisans and operatives; in part for journeymen and master workmen.

[1] Technical Schools of Germany. Diplomatic and Consular Reports, Nos. 561, 566, 572, 573, 594–7, 600–3, 608, 609, 611, 615, 618, 619, 630. Published by the British Foreign Office.

[2] Ware, *Educationtal Institutions of Trade and Industry*, p, 130. (The number stated is for 1898-9.)

In forty years, virtually the period of developing technical education in Germany, Germany has seen its policy turn a poor country into a rich one, the most powerful of Europe. I asked a German agent for German manufactures in London—"To what do you attribute the tremendous industrial development of Germany?" "I admit," I said, "the tenacity, the power of organization and co-operation of the German race. What," I asked, "is there beyond that?" His reply was "Technical education."

I questioned here and there in Switzerland, Holland, and Belgium, various men in industrial callings as to the value they attached to technical instruction given to artisans as well as to industrial experts. They had but one reply: *It is indispensable; our condition without it is unthinkable.*

VI. Organization of Industrial Education in the United States.[1]

Does the United States need a system of industrial education such as Germany and other modern European nations possess? Public opinion is practically unanimous in holding that we are forced to undertake its foundation as a basis and guarantee of industrial efficiency. Private initiative has already done much in the highest field and something in the middle field; a few railroads, departmental stores, industrial companies have already established their own corporation schools; a few other companies co-operate with existing schools; labor organizations have in some cases founded schools for their own members. We have come to take for granted that short-course instruction in commercial and trade lines is a peculiar field of private business schools and the Young Men's Christian Association. But, in general, the artisan is at his wits' end to get more technical training; in the main he cannot get it, or he gets it—a little—by letter, from Scranton, Pa. This activity, these schools, are a credit to our clerks and artisans; they are a reproach to our public educational system; in all, they are confessedly partial

[1] A summary review of typical schools for industrial, commercial, and household arts in Europe and the United States, and of certain city and national systems of technical education, will be undertaken by the Schools of Household and Industrial Arts of Teachers College and issued separately during the current academic year.

and hopelessly inadequate. We are now ready to turn this pioneer endeavor rapidly into organic form in the system of public education.

State legislation and state action now make possible public industrial education in Massachusetts, Connecticut, Georgia, Indiana, Kansas, Nevada, New Jersey, New York, Ohio, Wisconsin.[1] Already public schools have been founded that formulate, as do similar schools of Europe, the present needs of industrial and commercial training. Schools that may be taken as typical of the varied organization by which industrial training can be made effective, are as follows:

1. *Elementary Trade and Commercial Schools*

The first need in vocational training is for the widespread establishment of elementary trade and commercial schools to provide adequately for boys and girls beyond the elementary school age, who are destined to enter the lower ranks of industrial and commercial work. The years from fourteen to sixteen are now with us the critical period of youth; children of this age are still too young for shop apprenticeship; they find little to hold them in the grammar grades or the academic high school; at present they drift into this or that casual employment or unskilled occupation, or into crime. The foundation of trade schools with diversified outlet into occupations would, as the success of the new trade schools of New York City shows, enlist the interest of the pupils and have the co-operation of parents and employers. The industrial arts work of the elementary school will afford the natural preparation for the elementary trade and commercial school.

Such schools are best that unite a minimum of general training with a maximum of vocational training. Subjects of instruction of a general character such as English, history, mathematics, science, household arts, hygiene, and civics should be consciously organized in method and material to meet the personal and vocational needs of the pupils. Subjects of vocational training should include, in part, training in one or more of the basic industrial callings, and, in part, in cities, in many call-

[1] National Society for the Promotion of Industrial Education, Bulletin No. 12, 1910.

ings that require short specialized preparation, so that the pupils may quickly be fitted to earn a livelihood. Trade academic subjects may be taught by selected academic teachers, but shop and office subjects must be taught by trade and office experts in adequate shops. The product of trade schools, for the sake of the efficiency of the schools, should be made on trade orders and sold.

2. *Co-operative and Part-time Industrial and Commercial Schools.*

The specialization of trade, the cost of equipment, the value of shop experience, the need of self-support of the wage-earning class will always limit the development of trade schools. The experience of foreign countries and American experiments in Cincinnati, Fitchburg, Beverly, the evening courses of the Trade Schools of New York, the Foreman School of the Lowell Institute, and our School of Industrial Arts show how readily technical education can be extended if our schools can offer advanced instruction specialized to meet the needs of trade and professional workers without detaching them from the occupations to which they owe their support. That type of training, so far given in this country mostly at night, will, no doubt, follow the development of similar instruction abroad, and be offered through co-operation with employers, more and more in the day hours. The infinite specialization of industry renders this the most difficult task of educational organization; abroad it has taken at least fifty years of elaboration to bring about the efficient condition we find in Zurich, Munich, or Berlin.

Legislation must direct school boards everywhere to establish such trade and continuation schools; the raising of the compulsory education age to sixteen years will rapidly follow. Through these two classes of schools lies our hope of having a trained artisan and commercial class of American birth.

3. *Middle Technical Schools*

Our highest schools of engineering and architecture provide more and more adequately for the highest class of professional and technical workers. But the men and women of the middle technical classes we neglect, and this class—the efficient instru-

ments of the engineer and the architect and the superintendent—is probably sixteen times as numerous as the highest class. In the city of London, the new provisions for technical education include one high engineering school, seven polytechnic schools (middle technical schools), and an equal number of art-industrial schools. What we have already done sporadically in the textile schools of Lowell and Philadelphia, in the technical schools like Pratt and Carnegie and our Schools of Industrial and Household Arts of Teachers College must be done with an aim and a system by state and nation, adequate to the greatness of our commercial, industrial, and household interests.

4. *Art-Industrial Schools*

Middle schools for those industries that depend in large measure on art for their character and value are a most urgent need in the United States. Schools of the art industries, such as the printing industries, the ceramic industries, the finer wood-working and metal-working industries, interior decoration, photography, have in foreign lands demonstrated their usefulness to an extent that stirs the American observer to admiring envy. Here the splendid gift of artistic inheritance that comes to us with our immigrants we waste and lose: the very boy who works in hammered brass in the elementary school to excite the teacher's surprise and commendation, is found next year driving a delivery cart. When we open up schools for the art-industries we shall have American-born artists in our industries. Then, perhaps, we may produce color prints to equal the Germans, and fabrics to equal the French, and porcelain to equal the English.

How the colleges will react from the pressure of vocational training it is not easy to foresee. That they will adjust themselves in part to the new demands is certain; but it is probable that before the adjustments are made, we shall have colleges of a new type established that will unite the so-called cultural studies with training in the technical arts.

5. *Libraries and Museums.*

In the provision of public libraries, we lead the world. The need of industrial and art industrial and commercial museums

has still to be recognized and supplied. What we have done for museums of fine arts needs to be done in every great city for the industries by which these cities live.

6. *Agricultural Schools*

The organization of state systems of agricultural education from the rural school to the agricultural college will parallel in every stage the organization of the industrial and commercial schools of the towns and cities. Progress in this field of education is already rapid.

7. *Training Schools for Teachers of Technical Arts*

The extension of programme of normal schools to include the subjects of industrial (including commercial), household arts, and agricultural education is proceeding apace and should be pressed on. Technical schools have everywhere a duty and opportunity to select and to train the expert workers who can also teach; on such men depends the success of our trade and co-operative and continuation schools. Teachers College has tried to be forehanded by instituting its Schools of Industrial and Household Arts, the chief end of which is the training of teachers of technical arts; but already the demand exceeds the supply.

VII. Vocational Training a State Investment

This vocational training through schools has hitherto been the privilege mainly of the specially gifted or the specially fortunate; and in general this training has been confined to the professions, and the individual has had to pay for his training. We are ready now to think more broadly in this matter, and consider if national efficiency, which is a concern of the nation, can be provided for by state and nation; that the many to the measure of their ability and their needs, may have the training hitherto denied them; that we may utilize adequately our chief resources, the men and women of this land. The programme outlined above will take money; but it is, we insist, not expense, but investment. Investment by the individual in education is shown to be financially remunerative to the individual;[1] state investment in education is likewise demonstrably remunerative

[1] Person, *Industrial Education*, pp. 26–36.

to the state; there remains then this final state investment in state vocational education. That the burden is no more serious than that of any other type of secondary education is the main purport of Mr. Brandon's investigation, presented in the article that makes the third part of the present series.

The active participation of our national government in the institutions for furthering industrial betterment is already marked in many directions, especially in agriculture and science. The foundation of National Schools of Industrial Arts, paralleling the Ecoles des Arts et Métiers of France, would bring incalculable benefits to our industries, not only in training experts but in promoting research into materials and processes. This nation puts ten millions every few months into battleships and in a few years the battleships are junk; but the humble endowment of John Harvard, that began to work in 1636, is working still. The forts and battleships of the new industrial era are technical schools, and in the struggle for industrial supremacy ahead of us technical schools are more requisite than battleships. The future is to the new school-men and the new types of schools; for through vocational schools alone, in all their degrees and specialties, can we build for national efficiency.

To sum up: The new education aims to train our people to meet the problems of livelihood and living—to apply science and art, craft and machinery, method and organization to make possible a higher achievement of living for all. The great new stream of education must penetrate like a vast irrigation system through the land, pushing its rills into the remotest communities —as universal, as essential, as beneficent as the free elementary school. This is the latest and most measurable contribution of education to life. "That man only," said John Ruskin, "is educated, who is happy, busy, beneficent, and effective in the world." To that idea—that men and women may in this land be happy, busy, beneficent, and effective—the new movement of vocational education is devoted.

MODIFICATIONS WITHIN PUBLIC OR GENERAL SCHOOL PROGRAMS TO MEET INDUSTRIAL NEEDS

By Frederick G. Bonser

Professor of Industrial Arts Education, Teachers College, Columbia University

Until recently, wherever public support and control of education have developed, such education has been based upon the theory that it was supplementary to vocation. Its end point has been cultural or liberal. Until long after the Industrial Revolution, the numerous forms of apprenticeship training relieved the school from responsibility for any form of technical efficiency other than mastery of the "tool" subjects, the traditional three R's. The remoteness of school work from the larger problems of everyday life produced a conservatism among schoolmasters and school authorities making readjustment to new demands slow and difficult. Notwithstanding this, however, gradual and fundamental attempts at readjustment have taken place during the last quarter of a century. The cumulative force of a number of increasingly effective influences has brought about a change of attitude now marked by a greater responsiveness to life needs than ever before in the history of great school systems. The school has felt pressure from two distinct sources, the industrial and the pedagogic. In addition to the growing demand for greater degrees of skill and efficiency in the industrial worker, the school has been affected by the realism, naturalism, and general pragmatism which have been developing since the Renaissance. Through these forces can be seen a progressively broadening tendency to bring the work of the school into a more vital relationship with the immediate world in which the child lives. However, but a good beginning has really been made. In all countries, supplementary schools only remotely connected with the regular systems of general education have been developed as the immediate solution of the problem of

educating the industrial worker. In addition to the conservative attitude of school authorities are the difficulties of organization and administration necessary to meet the needs of vocational methods and practice. The effort to make these new provisions and adjustments for increasing practical efficiency and industrial intelligence without sacrificing the precious values in the culture and discipline of the traditional curriculum, is often abandoned as an impossible problem and the old regime goes on without even a compromise.

But among all of the western nations, beginnings have been made. The specific problem before us is to indicate modifications in the chief public school systems pointing toward the unification of liberal and industrial education. By public school systems are meant those school provisions made by public support for general education up to the time when higher education or specialized vocational training begins, schools of which our American elementary and secondary schools are types. No consideration will be given to schools in which pupils are segregated for the purpose of specialized training in industrial vocations. Continuation schools, trade schools, or supplementary schools of any other kind will not be included. To be sure, many of these latter schools are supported by public taxation, local or state, and many are under the administration of the general school authorities; but they are schools in addition to schools maintained in the same communities for general education.

Having seen the practice and noted the tendencies in a number of typical systems, constructive suggestions will then be offered pointing to further development in the democratization of public school systems.

Germany

In the development of supplementary schools for industrial and commercial arts, Germany has made marked progress within recent years. But in her schools for general education, both elementary and secondary, the conditions are much less hopeful. In country and village schools, gardening and agriculture have found a place of importance. In these schools, and also in many of the city schools, the gymnasia and real schools, several forms of handwork are found in grades corresponding to those

of our elementary schools. Up to the age of nine, simple work in clay, paper, cardboard, and natural and split wood is provided. More complex work in cardboard and rough wood construction follows up to the age of twelve. From twelve to fourteen, provision is often made for woodwork of a more refined character, occasionally some metal work, and here and there bookbinding and glass blowing. Work in glass blowing is usually confined to the making of simple apparatus for use in nature study or science work. In these upper grades the work indicated is for boys. In girls' schools there are often well planned courses in needlework. There are occasional schools in which both boys and girls are found, but they are in separate classes. The last years' courses often take on a distinctively practical character. In these years the work is differentiated on the basis of sex, both in kind and amount. In one of the people's schools of Munich, boys are held for more hours a week than girls, and girls are not required to take the same kind or amount of work in mathematics. The work of the last year is more than half devoted to practical ends, to a study of the principles and practice of probable vocational activities. Drawing and science studies receive much emphasis as vital to craftsmanship, although there is often much work in following exercises without variation, the pupil having little opportunity to design for himself the model he makes. In most schools, the drawing, as a subject, has a strong industrial bearing. The unification of the work in drawing and construction becomes quite complete in the continuation schools.

In connection with a number of schools, principally those of an elementary grade, are shops for work in wood and metals. However, there is little organic relation between the shop work and the regular school work in the elementary schools The shop work is elective and is taken outside of school hours. Practically no attempt is made to use the industrial arts as a means of direct education. The subject is not yet treated with the same consideration as other branches of instruction. But attempts in the direction of changing these conditions are not wanting. At Leipzic and Jena, summer courses are offered for training teachers in educational handwork. In the Leipzic workshop, special methods are worked out under the direction

of Dr. Goetze, and these are published in yearly courses. An attempt is made to work out courses in organic relation to the school curriculum. Teachers in regular school work may teach industrial arts in some cities if they take one or more holiday courses at Leipzic or elsewhere in special preparation. In some schools the shop work is taught by regular craftsmen who come to the school for this work alone.

As indicated in the foregoing, drawing and nature study have a place in all of the German elementary schools, and both subjects have a strong industrial bearing. In the changes for the secondary schools for boys in Prussia in 1901, certain modifications were made in the direction of greater emphasis upon industrial and commercial life, thus indicating a response of the school system in the secondary field also. In the study of foreign languages, it was pointed out that the languages be used more largely than formerly to introduce the student to a knowledge of the customs and culture of foreign peoples. In the selections for reading in the mother tongue, it was urged that more attention be given to geographic materials and that in the study of geography, more emphasis should be placed upon physical, industrial, and commercial phases. It was insisted further that a closer correlation between mathematics and physics should be made. While none of these changes provide direct industrial instruction, they all afford a means for the development of greater industrial interest and insight.

The kind of manual instruction developed in Germany thus far has not commended itself sufficiently to the government to secure adequate support for its introduction into the general schools as a required subject. Although wherever offered the industrial arts subjects are elective and usually free, the proportion of eligible boys taking them in many cities is but from five to ten per cent. In a very few schools the percentage runs up to nearly fifty, but this is exceptional. On the other hand, the success of the numerous continuation, trade, and other supplementary schools in meeting the need for immediately increased technical skill and efficiency has secured the most favorable state support for both financial aid and compulsory attendance laws. Continuation school attendance is compulsory up to sixteen years of age in twelve of the German states by state law; in nine

states it is compulsory in all of the towns or districts where it is imposed by local law, and in but the remaining four states is it voluntary.

It is thus seen that relatively little modification in general school practice has been made in Germany in response to industrial demands. Traditional influences of the father's vocation, limited financial outlook, small tendency to migration, and the limitations imposed by social distinctions all tend to fix the child's vocational choice at a relatively early age, without much attention to inclination or vocational guidance.

In the third report of the Royal Prussian State Industrial Office, 1909, it is stated that "the peculiarity of our system of secondary technical schools and of the elementary industrial continuation schools is found in that their aim is to make the matter of instruction immediately applicable to industrial life. This is the essential difference between them and the schools belonging to the ministry of worship and education." In Germany, France, Italy and Holland, the two systems, that of general education, and that of industrial education, are distinct. It is recognized however, that the industrial phases of education are built upon the foundation laid by the general system of schools. The present progress evidenced by the hold industrial arts work already begun is having upon those urging it most successfully, points to further modification of the general system of schools in the direction of a better foundation.

France

France has enacted full legislative provision for the introduction of industrial arts into the regular school system. Industrial work is given in every elementary school. In country and small village schools, the emphasis is upon agricultural subjects; in other schools, upon manual arts and industries. Although manual work has been compulsory in all elementary schools since 1882, it varies greatly in character and effectiveness. In the larger cities workshops are usually provided for upper grade pupils. For France as a whole, however, the work is more often done in the regular class room. In most schools some work is given in concrete geometry in connection with the arithmetic, the emphasis being upon relationships to problems of construc-

tion. In the lower grades are found clay work, paper folding, and cardboard construction. In the upper grades, boys have work in wood and occasionally in metals. The girls have sewing, lace making, millinery, garment making, cookery, and sometimes silk culture.

In Paris the work in industrial arts is much above the average of that for France generally. There are nearly two hundred wood-working shops in Paris and about one third as many shops for metal working. The theoretical work in the schools of Paris is taught by regular teachers authorized to give it by passing an examination in manual training and drawing. But the actual manipulation of tools and materials is taught by craftsmen who go from school to school. They are required to pass an examination in geometry, drawing and woodwork. Geometric and mechanical drawing are a very fundamental part of the work in industrial arts as taught in the schools of Paris. Exercise pieces, sets of prescribed models, constitute the largest part of the work in the plan. This logical-sequence approach, the selection of models for the sake of teaching a sequence of tool processes and manual skills, largely controls the materials and methods of work beyond the primary grades throughout France. The study of projects typically illustrating industrial processes and methods, and of the industries themselves, finds little place in the work. It would seem that the possibilities for making the industrial arts really significant as preparatory to industrial vocations has not yet been appreciated for the elementary schools. Certain of the educational values of such work from the cultural standpoint have been felt, however, and the state has recognized these by making it compulsory. Beyond the age of thirteen, school attendance is optional in France.

In 1880 a law was enacted "for grafting technical instruction upon existing primary schools." The existing manual apprentice schools, and advanced primary or "professional" schools were coördinated with the elementary schools. Children graduating from the elementary schools at thirteen were admitted to these schools for a three year course. Nothing like apprenticeship to any particular trade was attempted. The aim was to give general industrial instruction and develop manual dexterity. Workshops were provided, and from five and a half to seven and

a half hours a day were spent in manual instruction of an industrial character. The school day was from seven forty-five in the morning until six in the evening, with a noon and mid-afternoon intermission. Excursions formed an important part of the work. Beside the drawing, geometry, mechanics, and industrial economy taught in direct relationship to vocational needs, there were given also French, history, geography, biology, physics, chemistry, arithmetic, accounts, and hygiene. For girls the academic work was the same, but the practical work was made up of domestic economy, sewing, cutting, and fitting. From 1880 until 1892, these schools were under the authority of the department of education. In 1892 all advanced elementary schools, industrial or commercial in character, were placed under the authority of the minister of commerce and industry, and were designated as "practical schools of commerce and industry." By 1900 the number of these schools and of other schools for trade and technical education operated under the auspices of the state board reached nearly three hundred. The system for trade and technical education is remarkably thorough, but the segregation of this form of work from the field of general education has been quite complete above the elementary school since 1892.

In both France and Germany, therefore, there seems to prevail a theory that liberal education and technical education are more adequately developed in separate institutions after the minimum foundation of the elementary school is secured.

England

Although England has given state aid for diffusing a knowledge of the mechanic arts and the principles of design since 1837, and had encouraged such instruction in mechanics' institutes even as early as 1815, her first attempt to provide a means for so doing through the regular school system was not until about 1860. In 1857 the education department was reorganized and made to include the science and art department. From 1861, government grants were made for work in both science and art in some of the grammar schools in which it was found readily applicable where the modern side of education was developing. Under the act of 1870, the work in science and art was intro-

duced into the upper grades of the day schools. In 1872, special programs were promulgated giving definite plans for this work in the schools. By the act of 1890, the County Councils were given local authority to aid the work in science and art by grants derived from local revenues, and this aid could be given in both elementary and secondary schools. As reported by the Royal Commission of 1895, "County Councils have generally found it unwise, if not impossible, in dealing with children of school age, to treat technical instruction as a thing separate from general secondary education." Although it is not quite exact to speak of England's "system" of schools prior to 1902, it is fair to say that the schools providing for the general education of children of elementary and secondary rank had often received, where disposed to utilize it, rather generous aid in the introduction and development of industrial arts subject matter. The distinctively industrial bearing of the drawing and of the science work, wherever introduced, seems to justify rating these subjects as industrial. The impetus given to industrial drawing, industrial design, and industrial physics and chemistry as these subjects were directed, by the science and art division of the Education Department in the 70's, 80's, and 90's, has meant much to England in her development of manufacturing industries through this last quarter of a century.

Although great numbers of her boys left school at twelve or thirteen years of age to enter the ranks of the industrial worker, many had a foundation or an interest developed in the science and art work which brought them immediately into the evening schools or into the numerous supplementary day schools for continuing the work in science and industrial design. Outside of the schools for general education, the development of opportunities for the artisan class of working boys and men to continue their education by schools and extension classes has been really remarkable.

During the twenty years since 1890 the "manual training movement" has made itself markedly felt in England. The infant schools had developed simpler forms of handwork through the influence of the kindergarten idea. Woodwork for boys, and knitting and sewing for girls, made their way slowly into the upper grades. Since the education act of 1902, the develop-

ment toward a system providing instruction adapted to the needs of all children has given to industrial arts work in many schools a place almost as important as that of any other school subject. In most of the English cities handicraft work for boys, and domestic economy for girls are found with well equipped shops and laboratories. Although there is great variety in details of curriculum and method, most of the schools are developing the work from the industrial standpoint. Its purpose is avowedly vocational, yet there is increasing attention to the educational or liberal elements involved. In London, "centres" are established in connection with one school and the pupils of that school and neighboring schools are given instruction in that centre. These centres are well equipped. By 1909, accommodations had been provided for over 80 per cent of all of the children. All boys in Grade VI who are eleven years of age or more may take the handicraft work as may all boys also who are over twelve but below Grade VI. Most of the centres for handicraft give woodwork and this is suitably combined with drawing. Metal work is given in a few centres. For girls, centres are provided for domestic economy. Three divisions of this work are offered, cookery, laundry work, and housewifery. Girls of Grade V, and girls of twelve years of age below Grade V, are eligible to receive instruction in domestic economy. The work varies with the need of the particular districts in which the centres are located. Practical utility for the girls in their homes is a dominant factor in shaping the courses. A full half day is usually given to the work each week for both boys and girls, the teacher thus having two groups each day. In a few cities in England, periods are so shortened as to permit of three groups each day. In almost every school a series of models is found which usually combines the logical sequence idea with the industrial, that is, projects of appreciable utility are chosen and are so arranged that they provide the sequence for the development of tool processes and technical progress. In a few cities, the Sloyd system is found almost wholly unmodified. Most courses are planned to cover two or three years.

Below the grades doing work in centres or shops, there is often a well developed course in handwork. Paper folding, card-board construction, wire-work, cord-work, and parcel-tying

are often found. Clay modelling is occasionally employed. Knitting and needlework are very common in the lower grades.

The higher elementary schools take children at about eleven and one half years, giving them a course of three or four years. These schools make their curricula to fit the needs of particular localities. Some are distinctively industrial in their bearings, giving work as in the centers for industrial arts but devoting more time to the shops or laboratories, and making the mathematics, English, and drawing as definitely practical as possible. Others of these schools emphasize the commercial subjects, while still others are general in their nature.

Practically nothing has existed in England which could be regarded as a system of secondary education under state control. It is therefore almost impossible to say anything in general of work in industrial arts in secondary schools. The great "public" schools, Eaton, Rugby, and others, have very largely retained their distinctly classical character. St. Albans is a notable exception in its giving much attention to science, practical mathematics, and industrial arts. Through government grants from about 1881, aid was given to local initiative in the organization of science schools of secondary rank. In 1889 authority was given to the County Councils to aid schools of whatever kind in furthering technical education by local taxation, and, in 1890, local rates were largely relieved by a substantial annual grant from Parliament. Through this aid and influence the secondary schools willing to develop the "modern side" have introduced strong courses in science, drawing, and shop work. Many schools of a distinctively industrial type, as the Central School of Arts and Crafts, London, have been developed in recent years. These are maintained or aided by public funds. But they are distinctively separate from the plan of general education in their aim. They are to be classed in purpose and general character with the numerous and effective technical and evening schools for the further education of those who have left the regular schools and, in most cases, who have already entered the ranks of industrial workers.

Although system has been wanting in the whole field of secondary education in England and has but slowly developed in

elementary education, the general interest in industrial education has been so great that very material results are now evident in the character of the work accomplished in the schools maintained for general education. In Leeds, all pupils in the city elementary schools receive instruction in some form of handicraft. Quite in opposition to the general theory on the continent, English educators have felt that it was undesirable and unwise "to treat industrial education as a thing separate from general education." The theory that a trade cannot be taught in a school and that it can also not be taught without a school, has seemed to result in a wise unification of technical elements and cultural elements in the evolution of a satisfactory form of general and vocational education for the industrial workers.

United States

From the influence of the exhibit of the Russian system of manual or technical instruction at the Centennial Exposition at Philadelphia in 1876, and the establishment of the Washington University Manual Training School at St. Louis in 1880, there has been an increasing interest in the industrial arts as a part of our American plan of general education. The work was usually introduced in the earlier years of this movement through the curricula of the high schools. By 1910 more than half of the 1,384 cities of the United States, each with a population of 4,000 or more, had manual training as a school subject. Separate buildings and courses forming manual training high schools have developed in some cases, while in others, departments or courses in the regular high schools have been added. The work soon found its way into the elementary schools. It was urged here both from above and below. The kindergarten influence with its emphasis upon the educational values of occupations and hand work extended upward through the lower grades; the appreciation of educational values together with the practical bearing of the work for children of beginning adolescence brought the subject downward from the high schools to the upper grades. Courses in domestic science and domestic art for girls are quite as common as manual arts for boys. The term industrial arts as here used for United States usually stands for the work of both boys and girls. Taking the public

schools as a whole, more than half of all of them in this country have industrial arts in several years of their courses of study. While the work has been introduced largely on the basis of educational or liberal values, in 1910 there were twenty-eight schools offering instruction with a vocational aim in their secondary departments. Types of these schools are represented by the Stuyvesant High School of New York City, the Fitchburg (Massachusetts) High School, the Technical High School of Cleveland, Ohio, and the Manual Training High School of Indianapolis, Indiana.

Legislation providing for or permitting the teaching of industrial arts subjects varies widely in the several states. States specifically providing for manual training as a part of the regular instruction in public schools are Arizona, California, Connecticut, Florida, Maine, Massachusetts, Nebraska, New Jersey, Ohio, South Carolina, Tennessee, Texas, Vermont and Virginia, fourteen in number. Thirteen require drawing, fourteen domestic science, and five commercial subjects. Legislation relative to courses of study is such in most states that it is permissive to introduce any of these subjects at the will of boards of education. Authorization for the industrial arts subjects is conditional in some states, as in Illinois, where, by a law of 1909, a referendum for the establishment of manual training departments in township high schools is provided, or as in Indiana where the work is authorized in cities of from 50,00 to 100,000 population, and in Kansas, providing manual training high schools or departments in cities of the first class and giving boards of education authority to levy a one half mill tax for their local support. Special schools under the control of public education authorities for all kinds of industrial arts and agricultural schools of secondary grade are coming to be authorized in a number of states. In most of these, state aid is added to local support. County schools of agriculture, schools of industrial arts or trades, and departments of industrial arts in upper grades and high schools are all types of opportunity created or authorized by numerous state legislatures. Although supported by local taxation and often supplemented by liberal state aid, these schools are usually relatively independent of the regular public schools save in general administration. They cannot be regarded

in very many instances as a modification of the regular school plan to meet the new industrial need. They too often mean the segregation of boys and girls who are not attracted strongly to the academic subjects as usually presented and who are often looked upon as inferior in intelligence. This cleavage of the school into classes is often accentuated by the teachers' sending the most undesirable of the pupils to the industrial school to be rid of them. That this cleavage should be avoided is one of the significant reasons for such a reorganization of the regular school work that the needs of these motor-minded and thing-thinker types of children may continue to derive their best development from some phases of work in common with those more given to idea thinking.

On the whole, in the United States, it would appear that legislation has been quite largely permissive rather than mandatory with respect to the industrial arts subjects, leaving definite action chiefly to local initiative.

Indirectly the schools have aided in their general work in meeting some needs of the industrial worker by the introduction of courses in nature study and in drawing. However, until recently, these subjects were so remote in their content from the real problems of life, that they had very little bearing upon the industrial studies. The work in high-school science, mathematics, and drawing has also been taught in a manner so purely academic that they have contributed but little to the enrichment of industrial studies.

Until recently the vocational aim has not much influenced the work in the schools for general education. The particular kind of industrial arts work offered in individual schools has varied with the particular viewpoint emphasized, although there has been a rather strong tendency toward unity through the selection of the most desirable elements in each type of interest. In the actual development of courses of work in many schools there has been but little consciousness of classification or system. The search for materials which would lend themselves to school-room manipulation has been wide and thorough. Paper, cardboard, clay, raffia, native grasses, barks, splints, cords, textile fibres and fabrics, leather, wood, metals, and almost every other material which would yield to the constructive efforts of teachers and

children have been utilized. Although educational values have often had little consideration in the selection of materials, four types of approach are evident as determining the greater proportion of the materials and projects selected for the elementary school. These are the neighborhood approach, the evolutionary, the "psychological" or "pedagogical," so called, and the industrial. These are by no means mutually exclusive but overlap more or less, each with the others. The kindergarten type of work, often extended into the first two or three grades of the elementary school, combines elements of the neighborhood and "pedagogical" approaches. Activities of the home and community with miniature imitations of the occupational materials and products are reproduced in paper, cardboard, clay, and other easily manipulated materials; sequences of work are planned which take account of the psychological development of the child, providing for training in sense perception, accuracy, skill, and the growth of interest, intelligence, and judgment in occupational activities going on about him. The evolutionary approach rests on the belief that there is desirable a study of the activities and occupations of peoples who have begun with a very simple mode of life, and follow with some haste the changes due to progress in man's conquest over the forces and materials of nature. Much of the work in construction in lower grades consists in making the homes, utensils, costumes, and implements of primitive peoples, gradually recapitulating the industrial problems of the race.

The "pedagogical" method utilizes models carefully selected in such a series as to develop a mastery of tool processes, knowledge of materials used, increased skill, and general technical excellence in execution. This series of models may be either of practice pieces of no utilitarian significance—mere exercises in processes—or it may be made up of utilitarian projects involving these elements of construction. This work is usually found in upper grades or high school only and is most typically represented by the Sloyd system or a modified Sloyd system. In the main, the use of models of practical character is employed, although the exercises in abstract processes are still to be found in some schools. The modified Sloyd systems have some elements of the "neighborhood" approach as the projects are usually selected, where possible, with reference to the products

used or produced in the particular community. The industrial approach emphasizes the industrial needs and activities of the present day, and especially of the child's own community. It endeavors to select projects which open up the fields of large industrial import, leading the child to a knowledge of these in their significant relationship to him. He must use products in wood, textiles, food materials, clay, and metals and he cannot do this intelligently and appreciatively without comprehensive knowledge of the methods and processes used in their making, the sources of their materials, and the means of their distribution. A rich body of thought lies vitally involved in this form of approach. Projects are largely for the purpose of clarifying ideas of construction and for serving as points of departure for related interests and problems. But these projects may be selected in such sequence as to provide for the development of technical ability as does the Sloyd system, to secure that vital interest in the immediate environment provided by the neighborhood approach, and, through a study of the evolution of each particular industry, to gain the perspective and understanding of the present furnished by the evolutionary approach. Further than these, the knowledge, the mastery of technique, and the interests developed, are all of rather direct vocational value for those whom choice or circumstance places in industrial vocations.

Constructive Suggestions

The industrial viewpoint, developed within the last decade, is still in a very formative stage. It is illustrated as a dominant method of approach in but few schools. It does not apply very fully to the work of the primary grades. In these grades the work has been, is, and will probably continue to be dominated largely by a combination of the neighborhood and evolutionary forms of approach with such consideration for sequence as will meet the needs for the development of growing physical and mental powers of manipulation.

This primary period is not the time for emphasis upon accuracy, precision, or technical excellence of a high order in any phase of constructive work. In so far as these elements are attained, they should be largely as by-products of work whose intrinsic aim is the expression of ideas in industrial materials.

Degrees of excellence in finished products are to be measured in terms of the child's own best efforts without much repetition, rather than in terms of adult excellence. For the grades above the third, the industrial motive may receive increasing emphasis. Mastery of materials becomes sufficient to enable problems in construction to be solved as they are solved in the industries studied. Processes may be typically illustrative of those actually used in the industries. Studies in the historical phases of the industries may become studies in the evolution of industrial processes and problems and become valuable in interpreting and understanding the highly complex character of present day industrial life. Wherever the industrial motive is dominant in the selection of projects in the middle and upper grades, the correlated elements of history, geography, drawing, design, and mathematics appear to open up lines of investigation into the commercial manufacture of the products of which they are type illustrations. The forms of machinery which have been invented and are used, the types of power used, factors determining the location of power plants, the needs for organization of numerous aspects or parts of the industry into a system, the sources of materials and the distribution of products, the social life of the industrial workers—all of these, and some other related interests make up a portion of the work. Industrial intelligence, insight, and appreciation are all quite as important as technical excellence in execution. There is a growing feeling that all children, regardless of future vocations, should have such experience in the industrial work as will enable them to be intelligent and appreciative in their life contacts with industrial products and situations. All use the products of the industries—clothing, furniture, foods, vehicles, utensils, dwellings, and other essentials of material life. For the great majority this knowledge providing intelligence and appreciation in selecting products, for the use of economy in their purchase, use, and care, and for understanding the industrial problems of our times in their larger social aspects are of greater worth than the mere skill which may be developed in making any of the products. Relatively few of our people are employed in making furniture, but all use it. Cultivated taste in selecting furniture, good judgment in determining its worth, and usage which conserves its beauty and

utility are important for all. For developing this intelligence and appreciation, the elementary school, the school whose work is common to all without reference to sex or vocation, should certainly provide.

For the differentiation which is imposed by both the development of special inclinations and aptitudes in children on the one hand, and the call of vocations on the other, the secondary school should provide further development for the prospective machinist or cabinet-maker or printer, as much as for the prospective doctor or lawyer or minister. That this period for differentiation begins at approximately the close of the sixth school year rather than at the close of the eighth, seems to be supported by both psychological and social evidence. The tendency to reshape the school program to meet this condition is evidenced by the common introduction of industrial arts work of a secondary type at the beginning of the seventh school year, by the contemplated development of a six year secondary school course in a number of communities, and by the development of the three year intermediate school followed by a three year secondary course in some other cities or sections. In many cities the work in "manual training" of secondary character has been found unsatisfactory. It has been found too empty of thought content, of a body of organized ideas, to justify it fully as a cultural subject, and too inadequate in possibility for developing skill and trade efficiency to make it of much vocational worth. Segregating those selecting the work or pressing into it children of relatively poor ability for other school subjects, has often stigmatized the work as being for a class either lower in the social scale, or inferior in intelligence. Other subjects vitally important have failed to provide connections and relationships, and the work has stood more or less isolated from other school work on the one hand, and from industrial life in the real world on the other. This very isolation has tended toward the development of the types of schools which have grown up independently of the regular school system, the continuation schools, vocational schools, and trade schools. That the general school system can solve the secondary phase of this problem is in part evidenced by the fact that the twenty-eight cities referred to in the foregoing have accomplished much

towards a solution. That more can and of right ought to be accomplished through the regular school system we believe to be possible when a more satisfactory organization of the work is developed. To make this better organization is one of the large problems of our decade. We cannot graft upon our American system unmodified any plan as developed in any European country and hope to find it wholly satisfactory. Our ideals, our social conditions, and our industrial situations are fundamentally different in many respects essential to the problem.

To accomplish this needed reorganization, certain fundamental factors will have to be incorporated. Among these are an increased amount of time for practical work in shops and laboratories, possibly necessitating the lengthening of the school day; an almost complete change of attitude in the teaching of drawing, bringing out those phases and elements vital in design and draughtsmanship; a selection and organization of the principles and applications of physics and chemistry on the basis of their value and significance for industrial constructions and processes; a similar reorganization of mathematics of secondary grade; a selection of elements in physical, industrial, and commercial geography more vitally related to the sources, manufacture, and distribution of materials and products; and a new evaluation of history materials in their bearing upon industrial evolution. A curriculum constructed out of these reorganized subjects, and providing time and opportunity for shop work of a type which would constantly make application of principles developed in design, drawing, mathematics, and physics, would combine cultural elements and vocational elements, making for more efficient citizenship in all its phases. With the work that should be taken in common with those secondary pupils electing the industrial arts course and those in other courses, the social unity of the school would be preserved. Most of the foregoing subjects, if reorganized on the basis proposed, would be found so fundamentally sound as pertaining to affairs and to life in our day that they would commend themselves for their pragmatic worth to many students regardless of their anticipated vocations.

One of the largest general problems of the school is to be more helpful in giving boys and girls opportunities to find themselves. In view of the changes and the growing ideal interests

of children of the early adolescent period, it seems inexcusably wasteful to society so to neglect the question of vocational guidance. Even for those who can and do go through the four years of the usual high school there is rarely any real opportunity offered for the discovering of one's vocational aptitudes. The London, England, plan of scholarships for promising upper grade pupils, enabling them further to develop talent and capacity discovered by teachers and school inspectors, is full of suggestiveness for American schools.

The social side, the really human side, of the education of the industrial worker has been almost wholly neglected. In a small number of schools, beginnings have been made. The hours of labor, the amount of child labor, the wages, the standards of living, the amusements and opportunities for education, the status as to trade unions or fraternal organizations, the protection of life and limb by employers' liability laws—these and other questions that are of much social interest and significance receive attention in but few schools. That a knowledge of these facts and relationships is important to the child in his selection of a vocation is certainly true, and it is just as true that this knowledge is of value in its bearing upon that society in which the industrial worker is to share the privilege of making the laws of the land and of sharing its corporate life.

That expediency demands the erection of means for educating further those who have dropped out of school and are now at work in the industries is coming to be generally accepted. But to leave the solution of the problem to schools supplementary to the trades and vocations, and wholly independent of the general school administration, would seem to be in violation of the nature of a system of democratic education. The only solution consistent with our general theory of democratic education is the development of such elementary and secondary schools as will provide, under the general system, that equality of opportunity for all which will enable them to live more efficiently in their vocations as well as out of them whenever circumstances require that the vocation must be entered upon.

THE COST OF INDUSTRIAL EDUCATION IN THE UNITED STATES: A STUDY OF FIFTY TYPICAL SCHOOLS

By H. C. Brandon

Director of Industrial Education, City Schools, Portland, Oregon

At the present time when so much attention is being directed toward the subject of industrial education, teachers and others interested in this new line of work are seeking information concerning the organization and cost of industrial schools already in operation.

In order to secure as much as possible of this information, a study has been made covering four rather distinct purposes, namely: (1) To secure data on the cost and organization of industrial schools and to arrange them in convenient form for reference; (2) to make a comparison of the cost of industrial schools with that of the common schools as found by Professor George D. Strayer in "City School Expenditures"; (3) to make a comparative study of the individual schools of the various types; and (4) to suggest means by which a more helpful report may be made.

The first attempt to secure such material was made by examining city school reports, census reports, catalogues and circulars from the various industrial schools.

In general, data furnished by the city school reports were disappointing. The courses of study usually were given, but items of expenditure were grouped in such a way that it was impossible to differentiate the expenditures of the various items. For example, in some cases the item of salaries included teaching, supervision and janitors' salaries. In other cases janitors' service was found under the item of maintenance. The census reports, while containing more or less complete statements of the larger items of expenditure, were not available later than 1909, and the items were not grouped under headings that

admitted of comparison with Professor Strayer's report. The catalogues and circulars failed to state the expenditures in any form that would admit of comparison among themselves.

A questionnaire was sent to each of the several industrial schools to secure first hand data of expenditures and organization that would be in tangible form and which would admit of comparison with the report of Professor Strayer.

Of the one hundred letters sent out, answers were received from seventy-five schools, twenty-five of which were so incomplete that the material could not be used. Some left the items of expenditure vacant, stating that their school was a part of the city school system and that the city's supplies were bought together for all schools and departments.

Other schools failed to include one or more items of expenditure and the report, therefore, had to be discarded. After considerable supplementary work fifty fairly complete reports were obtained, from Table I was made out.

In examining this table, there will be noted at once the diversity of the schools as to the number of pupils, number of courses, and cost of maintenance and equipment. Compare, for example, School No. 4 which has only 45 pupils and an original equipment of $17,000.00 with School No. 1 which has 3136 pupils and an equipment of $1,081,777.00. These schools differ so widely in organization and purpose that any comparison which might be made can be used only to show educational tendencies in a very general way. Among the factors that affect the cost is that of location. The cost of maintenance of a school in Boston would be quite different from that of a school in Indianapolis or Omaha. Some courses require an expensive laboratory equipment in which only 15 or 20 pupils can be accommodated while in lecture rooms as many as 40 or 50 pupils may be successfully handled. Again the cost of supplies and apparatus in some subjects, mathematics for example, will probably be nothing while in others like plumbing or steam-fitting it will be very high. Also the cost of maintenance of a building for a school of 400 pupils may be as great as that of a school two or three times as large. This may be seen in the case of some of the new schools where large and expensive buildings have been erected but where the courses have not yet filled up. In

TABLE I

SUMMARY OF DATA FOR FIFTY INDUSTRIAL SCHOOLS

Number of School	Students			Term in Months	Number of Courses	Salaries of Teachers and Supervisors	Repairs and Replacements of Equipment	New Equipment	Care of Building, Janitors' Salaries, Fuel, Water, etc.	Books, Supplies, Materials, etc.	Other Expenditures	Original Cost of Equipment
	Male	Female	Total									
1			3136	9	18	$97,550	$200	$2,000	$37,236	$3,500	$5,000	$1,081,777
2	1450		1450	10	6	76,000			9,500		13,500	
3	235		235	12	6	25,000		4,000		6,000		550,000
4	300		300	12		14,747	320	20,692	1,486	3,002	5,347	48,000
5	202	812	1014		7	122,000		1,000		505	2,029	10,000
6	310		310	10	8	18,900			4,000	3,500		182,000
7	45		45	12	6	10,000		17,000	5,500	500		17,000
8			381	12	8	8,841			1,635	2,183	871	33,346
9	767	977	1744	10	13	45,900	250	7,281	4,243			63,550
10	263	465	728	9	13	45,900	2,500		1,200			38,800
11	645	24	669	11	14	30,050		11,692	22,096	9,404		556,452
12	199	110	229	12	6	34,648	4,831			1,052	33,537	
13	250		250	10	10	26,017			9,371	3,424	17,661	
14	800		800	10	11	18,000	150	500		2,350		90,000
15	688		688	12	18	12,826			5,796	1,053		50,000
16		400	400	12	8	29,000			4,500	1,000		29,000
17	144	460	604	8	5	12,000			300	150		12,000
18		405	405	12	6	8,286	1,282		1,410	1,125	540	7,000
19	120		120	12	6	7,500		800	1,500	500		5,800
20	1500	1572	3072	10	6	240,000	2,700	1,506	16,328	12,000		934,776
21	320	4	324	12	3	12,000	1,000		1,800		5,000	90,000
22	14	391	405	9	5	4,100						2,312
23	636	561	1197	9		51,000	500	2,840	8,641	2,500	101	24,000
24	1073	892	1965	10	7	120,000	43,000	15,000				43,000
25	2043	989	3032	9		100,000			25,000	6,000		2,000,000

TABLE I—(*Continued*)

SUMMARY OF DATA FOR FIFTY INDUSTRIAL SCHOOLS

Number of School	Students			Term in Months	Number of Courses	Salaries of Teachers and Supervisors	Repairs and Replacements of Equipment	New Equipment	Care of Building, Janitors' Salaries, Fuel, Water, etc.	Books, Supplies, Materials, etc.	Other Expenditures	Original Cost of Equipment
	Male	Female	Total									
26	1010		1010	9	5	$25,000	$10,000	$11,000	$4,500	$1,500	$500	$56,000
27		2470	2470	8	16	22,263	1,480		2,126	1,151		1,322
28	51		51	12	6	5,480		1,275	490	300	305	
29	120	33	153	10	14	12,900		2,500	2,500			25,000
30	70	35	105	9		7,900	1,000		650	1,700		5,000
31	500		500	12		14,500	200	1,000	600		2,500	10,000
32	160		160	12	5	3,200				1,200	200	5,000
33	285		285	12	9	32,000	1,000			800		80,000
34	1279		1279	10	10	100,450	5,000	7,500	24,500	1,000		50,000
35	124	170	294	9	11	4,765	2,000	16,000	500	275	350	6,940
36	2001	1778	3779	10	28	65,500	10,000		9,500			150,000
37	1015	1775	2790	9	19	41,748	6,859	2,655	10,249	3,330	16,058	321,000
38	1711	900	2611	8	24	110,000	100,000	150,000	31,886	1,400	13,457	1,000,000
39	117	114	231	10	6	8,400	2,500		1,500	1,226		90,000
40	1100	450	1550	9	13	62,000	10,000	45,000	24,747	5,943	130,000	1,791,000
41	1144		1144	12		15,000	400	5,000	6,400	1,100	3,000	42,500
42	304	302	606	10	10	32,000	5,000	5,000	2,700	600		60,000
43	425	125	450	6	10	4,018		1,928	484	482	285	35,000
44	70		70	12	4	5,900		3,500		1,000	600	
45	575	757	1332	9	11	16,950	309		443			253,000
46	1019	651	1670	12	18	17,900	2,000	2,000	1,500	3,000	2,000	60,000
47	782	1000	1782	10	8	89,558	1,753	579	8,474	2,748	1,245	60,000
48	950		950	10	7	74,910			12,300	6,000		500,000
49	253	257	510	10	6	2,650	50		500			12,000
50	523	356	779	9	13	95,747	1,977		6,630		1,086	226,000

NOTE: Items of expenditure will be found reduced to per cents of total expenditure in Table II.

TABLE II

COST PER PUPIL, AND PER CENT OF TOTAL COST OF EACH ITEM

Number of School	Cost per Pupil per Month	Per Cent of Total Cost					Cost of Equipment per Pupil	Cost of New Equipment per Pupil
		Teaching and Supervision	Repairs and Replacements	Care of Buildings, Janitors' Salaries, etc.	Books, Supplies, Materials, etc.	Other Expenditures		
		Per Cent	Per Cent	Per Cent	Per Cent	Per Cent		
1	$5.34	67.0		26.3	2.4	3.44	$345.00	$.61
2	6.41	76.7		9.6		13.7		
3	10.97	80.6			19.3		302.00	
4	8.91	59.2	1.3	5.9	12.	21.4	160.00	
5	12.41	96.4		1.6	.3	1.6	9.60	1.06
6	8.11	71.2		15.1	13.2		2,585.00	
7	29.63	62.5		34.4	3.1		378.00	
8	3.10	65.3		12.	16.1	6.4	87.20	
9	5.36	94.4	.2	4.5	.5		36.50	.01
10	8.47	92.0	5.4	2.4			53.90	3.42
11	9.04	48.9		35.9	15.2		832.00	
12	26.95	46.7	6.5		1.4	45.2		21.20
13	22.50	45.7		16.4	6.4	31.5		
14	25.69	86.	2.4		11.2		112.00	.19
15	4.61	33.		14.6	28.7	23.7	72.90	
16	7.91	84.6		13.4	2.8		72.20	
17	2.59	96.4		2.4	1.2		20.00	
18	2.60	65.2	11.1	8.8	4.2	10.9	17.30	3.61
19	5.65	79.		16.8	5.3		48.30	
20	8.82	88.5	9.9	6.	4.4		311.00	.88
21	4.82	60.6	5.3	9.0		25.3	278.00	3.18
22	1.06	100.					5.72	
23	2.66	81.2	.9	13.7	4.1	.9	20.50	.48
24	9.06	67.4	24.1	8.5			21.80	21.80
25	4.80	76.3		19.1	4.5		650.00	
26	4.56	60.2	24.0	10.8	3.6	1.2	54.90	9.85
27	.39	82.4	5.1	7.8	4.2		.53	.60
28	19.43	83.		7.4	4.5	4.8		
29	10.64	92.3		7.6			162.00	
30	9.28	70.2	8.8	5.7	15.1		46.70	9.50
31	2.96	81.4	1.1	3.4		14.	20.00	.40
32	2.34	69.6			26.3	4.3	31.20	
33	11.40	94.6	2.9		2.3		282.00	3.51
34	10.24	76.7	3.8	18.8		.7	39.30	3.93
35	25.30	60.4	25.3	6.3	3.4	4.4	23.70	6.82

TABLE II—(*Continued*)

Cost per Pupil, and Per Cent of Total Cost of Each Item

Number of School	Cost per Pupil per Month	Per Cent of Total Cost					Cost of Equipment per Pupil	Cost of New Equipment per Pupil
		Teaching and Supervision	Repairs and Replacements	Care of Buildings, Janitors' Salaries, etc.	Books, Supplies, Materials, etc.	Other Expenditures		
		Per cent	Per cent	Per cent	Per cent	Per cent		
36	$2.49	69.2	10.2	10.0			$39.60	$2.65
37	3.11	53.5	8.7	13.2	4.2	20.5	1,650.00	
38		42.	39.	12.4	.5	5.2	382.00	2.50
39	4.81	75.4		13.	11.1		387.90	38.20
40	7.23	61.6	18.3	11.	9.		1,126.00	
41	1.88	57.2	1.5	24.7	4.3	11.4	37.30	4.35
42	6.35	79.3	12.4	6.7		1.4	95.50	8.30
43	2.48	59.8		28.7	7.1	4.2	75.50	4.27
44	13.33	78.6			13.3	8.		50.00
45	1.40							
46	1.12	67.8	7.5	5.6	11.3	7.5	36.60	1.19
47	6.18	86.2	1.6	8.1	2.6	1.1	33.80	.99
48		80.		13.2	6.4		52.80	
49	6.27	82.8		15.6			21.70	.09
50	3.63	61.9	7.7	26.		43.	282.00	2.58

some cases where the work is given only at night instruction can probably be secured for less than in day work. Again in some schools pupils may be enrolled in a single class while in others three or four separate courses may be pursued.

In this report the following types of schools are represented:

1. *Manual Training Schools*, usually a part of the public school system and originally intended to contribute to vocational efficiency; now interpreted by educators to furnish a basis for a liberal education, making the pupil familiar with industrial processes and thereby affording an opportunity for an appreciation for and a sympathy with those engaged in industrial vocations.

2. *Technical High Schools*, originally organized to aid the pupil who wished to enter the higher ranks of shop and trade

TABLE

TABLE OF

Cost per pupil of equipment and maintenance, and per

Cost per Pupil per Month		Repairs and Replacements		Other Expenditures		New Equipment per Pupil	
Dollars	Frequency	Per Cent	Frequency	Per Cent	Frequency	Dollars	Frequency
Less than 1	1	Less than 1	2	Less than 1	2	Less than 1	8
1	4	1	4	1	4	1	3
2	7	2	2	2	1	2	3
3	4	3	1	3		3	5
4	5	4		4	5	4	2
5	3	5	3	5	1	5	
6	5	6	1	6	1	6	1
7	2	7	2	7	1	7	
8	4	8	2	8	1	8	1
9	3	9	1	9		9	2
10	3	10	1	10	1	10	
11	1	11	1	11	1	—	
12	1	12	1	12		21	2
—		—		13	1	—	
19	1	18	1	14	1	38	1
—		—		—		—	
22	1	24	2	20	1	50	1
—		25	1	21	1		
25	1	—		22			
—		39	1	23	1		
29	1			24			
				25	1		
				—			
				31	1		
				—			
				45	1		
Median	4.8		6.5		5.5		2.1
2Q	6.1		9.2		14.0		4.8
Per Cent 2Q is of Median	126.0		142.0		255.0		230.0

III

FREQUENCIES

cent of total cost of the several items of expenditure

Teaching and Supervision		Care of Buildings, Water, Fuel, etc.		Books, Supplies, Materials, etc.		Original Cost of Equipment per Pupil	
Per Cent	Frequency	Per Cent	Frequency	Per Cent	Frequency	Dollars	Frequency
				Less		Less	
33	1	1	1	than 1	2	than 10	3
—		2	2	1	2	10	1
42	1	3	1	2	4	20	6
—		4	1	3	3	30	7
45	1	5	3	4	8	40	2
46	1	6	3	5	1	50	3
47		7	3	6	2	60	
48	1	8	3	7	1	70	3
—		9	2	8		80	1
53	1	10	2	9	1	90	1
—		11	1	10		100	
57	1	12	3	11	3	110	1
58		13	6	12	1	—	
59	2	14	1	13	2	160	2
60	3	15	2	14		—	
61	2	16	2	15	2	260	1
62	1	17		16	1	270	1
—		18	1	—		280	1
65	1	19	1	19	1	—	
66		—		—		310	2
67	1	24	1	26	1	—	
68		25		27		340	1
69	2	26	2	28	1	—	
70	1	27				370	1
71	1	28	1			380	2
—		—				—	
75	1	34	1			650	1
76	1	35	1			—	
77						830	1
78	1					—	
79	2					1120	1
80	2					—	
81	2					1650	1
82	1					—	
83	1					2585	1
—							
86	2						
87							
88	1						
—							
92	2						
93	2						
94	2						
—							
100	1						
Median	73.0	11.5		4.9		$60.00	
2Q	21.7	8.0		8.4		$259.80	
Per cent 2Q is of Median	30.0	70.0		171.0		$433.00	

workers. They have gradually developed into preparatory schools for college engineering students.

3. *The Intermediate Industrial School,* in general a type of school designed to take the youth of thirteen or fourteen years of age when he leaves the common schools and teach him the elements of a trade and such supplementary work as is deemed necessary for pursuits in which a high grade of industrial intelligence rather than skill is desired.

4. *The Trade School,* intended to teach in a short time all the skill and knowledge necessary that the workman may enter into competition with workmen already in the trade.

5. *The Continuation School,* which has for its purpose the further development of the worker who is already actively engaged in an occupation. These are, at present, usually evening schools carried on in connection with manual training schools, technical high schools, and at institutions such as Pratt Institute and Cooper Union. In this type of school the emphasis is upon the work supplementary to the trade,—mathematics, physics, etc.,—as the student is usually actively engaged in some vocational pursuit.

Table II is given that we may make a comparison of the various items of expenditure with those found by Professor Strayer in "City School Expenditures" in which he made a study of 57 cities, the inhabitants of which ranged from twenty-five to fifty thousand and in which he determined what he considered the proper distribution of money among the different items of expenditure. This distribution is given in Table IV.

In Table II are given the cost per pupil per month, not taking account of deterioration or new equipment, and the various expenditures reduced to percentages of total cost. For example, School No. 12 pays $26.95 per pupil per month. It expends 46.7 per cent of its budget for teaching, 6.5 per cent for repairs, 1.4 per cent for books, supplies, and materials, and 45.2 per cent for other expenditures. The original cost of equipment per pupil is not known and it pays $21.20 per pupil for new equipment. It seems strange that School No. 22 spends 100 per cent for teaching and supervision. One must certainly conclude that the writer has failed to include the other items of expenditure in the report. Another surprising thing is that some schools

spend such a small amount per pupil while others are so extravagant. For example, School No. 27 spends only $0.39 per pupil per month while No. 12 spends $26.95 or nearly 60 times as much. However, from an educational standpoint the extreme cases are not so important as the general tendency of the group. This is ordinarily found by taking the average but since the average is affected largely by the extreme cases a much better measure of the tendency is the median, that measure above and below which an equal number of the cases lie.

To determine the medians Table III has been made out. It is made from Table II by expressing in terms of frequency in ascending series differences of one dollar. The table reads: In the case of the cost per pupil per month there was one school paying less than one dollar per pupil per month. There were four paying more than one dollar and less than two dollars, and so on. It will be noticed that there are more schools paying between two and three dollars per pupil per month than any other quantity. The median in the case of the cost per pupil per month is $4.80.

It will be noticed in Table IV that the proportions in the distribution of the different items of expenditure do not differ much from those found in the common schools, and that the cost per pupil per month is less than twice that of the common schools. It is evident that the item of repairs and replacements is higher in the industrial schools, a fact naturally to be expected.

TABLE IV

PERCENTAGES OF TOTAL COST IN INDUSTRIAL SCHOOLS COMPARED WITH THOSE FOUND BY PROFESSOR STRAYER IN THE PUBLIC SCHOOLS

	Public Schools	Industrial Schools
	Per Cent	Per Cent
Teaching and Supervision	70 to 75	73.0
Care of Buildings, Janitors' Salaries, Fuel, Water, etc	10 to 14	11.5
Text-Books, Materials, Supplies, etc	4 to 6	4.9
Repairs and Replacements in Equipment	3 to 5	6.5
Other Expenditures		5.5
Cost per Pupil per Month	$3.20[1]	$4.80[2]

[1]Based on average daily attendance.
[2]Based on enrollment.

The fact that industrial schools vary so widely in organization and purpose would lead one to expect a wide variability in cost of equipment and maintenance. A study of Table III justifies this expectation.

TABLE V

A Comparison of the Variability of Industrial Schools and Common Schools, Using as a Coefficient of Variability the Per Cent Which 2Q is of the Median

Per Cent of Total Expenditure Used For:	2Q	Median	Per Cent which 2Q is of the Median
Industrial Schools			
Teaching and Supervision	21.7	73.0	30
Care of Buildings, Janitors' Salaries, Fuel, Water, etc.	8.0	11.5	70
Text-Books, Materials, Supplies, etc.	8.4	4.9	171
Other Expenditures	14.0	5.5	255
Cost per Pupil per Month in Dollars	6.1	4.8	126
Common Schools[1]			
Teaching	9.0	68.4	14
Supervision	8.0	8.0	100
Janitors' Salaries	4.0	7.6	65
Fuel	1.0	5.9	16
Cost per Pupil per Month	7.0	28.8	25

[1]Based on Professor Strayer's Report.

Frequencies for the various costs per pupil per month, of original equipment and new equipment, and of the percentages of the total amount used for the several items of maintenance have been arranged in order and the median values found. These median values are shown at the foot of the respective columns. The 2 Q value, that showing the limits within which the middle 50 per cent of the cases lie, is also given. By finding the per cents which 2 Q is of the median, we get a coefficient of variability giving a still better idea of the variability than the 2 Q alone. For convenience in making a rapid survey of this variability in summary and a comparison by industrial schools and public schools Table V has been derived from Table III. It will be noted that for most items the variability for industrial schools is greater than for the public schools.

The very high variability of the items, text-books, etc., other expenditures, and cost per pupil per month for industrial schools can be appreciated more fully in meaning by reference to these items in Table III. Here it will be seen that there is a "skew" distribution, the greatest number of frequencies being in the portions representing the lowest values. The same explanation also applies to the high variability coefficients for the original cost of equipment, the new equipment, and the repairs and replacements in Table III.

In the following tables an effort has been made to bring the schools of a particular type together for a comparison of the various items of cost. In many of the schools no definite classification can be made as the school is doing work along two or more of these vocational lines. For example, we find manual training schools, whose shops are used for night school work. In these there seems to be no differentiation of expenditures for the two lines of work. In classifying the writer has tried to place each where the greater part of the expenditure seems to be made.

Under the type of Manual Training Schools we have the following:

Number of School	Cost Per Pupil Per Month	Per Cent for Teaching and Supervision	Equipment Per Pupil
9	$5.36	94.4	$36.50
10	8.47	92.0	53.90
20	8.82	88.5	240.80
34	10.24	76.7	39.30
35	25.30	60.4	23.70
42	6.35	79.3	95.50
47	6.18	86.2	33.80
50	3.63	61.9	211.80

It will be noticed that the variation in the cost per pupil is not very great among these schools except in the case of School No. 35 which is an endowed school whose enrollment is not yet very large.

The following may be classified as Technical High Schools:

Number of School	Cost Per Pupil Per Month	Per Cent for Teaching and Supervision	Equipment Per Pupil
2	$6.14	76.7	$72.20
16	7.19	84.6	72.20
24	9.06	75.4	21.80
39	4.81	75.4	378.00
48		80.0	52.80

Under the heading of Trade Schools have been included only day schools of more or less well recognized standing.

Number of School	Cost Per Pupil Per Month	Per Cent for Teaching and Supervision	Equipment Per Pupil
3	$10.97	80.6	$312.00
4	8.91	59.2	160.00
5	12.41	96.4	9.64
6	8.11	71.2	587.09
8	3.10	65.3	87.20
15	4.61	33.0	72.90
18	2.60	65.2	87.20
31	2.96	81.4	20.00

It will be noticed that the percentage devoted to instruction is lower in trade schools than in the schools shown above. This is probably due to the fact that materials for trade schools cost more than those for manual training or technical schools.

Among those schools that offer instruction to the workman already in the trade (Higher Trade Schools) the following seem to be the more important:

Number of School	Cost Per Pupil Per Month	Per Cent for Teaching and Supervision	Equipment Per Pupil
1	$5.34	67.0	$345.00
25	4.80	76.3	650.00
40	7.23	61.6	1,126.00

Since the Vocational and Part Time Schools are of recent organization, complete reports of expenditure are hard to secure. A few are given here:

Number of School	Cost Per Pupil Per Month	Per Cent for Teaching and Supervision	Equipment Per Pupil
19	$5.65	79.0	$48.30
28	19.34	83.0	
30	9.28	70.2	20.00
44	13.33	78.6	
46	1.12	67.8	36.60

Disposition of School Products

One of the factors in an industrial school that affects materially the cost of maintenance is the nature of the product made in the school and the manner of its disposal. In the technical and manual training schools there is a tendency to let the pupils pay for the material and take the product. In the trade and intermediate vocational schools an attempt is usually made to approach shop conditions in which material and workmanship are the same as in shops and factories and in which the product is sold in competition with factory products.

The following table shows the various ways in which the problem is handled in the different schools.

Number of Schools	Disposition of Product
14	Product given to pupils.
1	Nothing sold.
3	Sold in open market.
7	Used in school.
2	Thrown in scrap heap.
4	Materials paid for and product taken by pupils.

Those that consigned the product to the scrap heap had in general materials that could be used over again, such as plumbing material, steam fittings, brick, etc.

Variety of Courses of Study Offered by the Schools Represented in This Report

One is surprised at the great variety of different types of industrial activity that are represented in the industrial schools of the United States. The following table is compiled from the schools represented in this report and is given that the reader may secure easily and quickly some idea of the scope of industrial instruction.

Subject	Industrial Work Frequency	Supplementary Work Frequency
Drawing		
1 Mechanical	15	1
2 Art Design	3	2
3 Pattern and Estimating	1	
4 Free Hand Drawing	1	
5 Design for Textiles	3	
6 Architectural	6	
7 Machine Design	2	
Wood Working		
8 Joinery	32	
9 Carpentry	11	
10 Cabinet Making	9	
11 Framing	3	
12 Carving	2	
13 Pattern Making	26	
14 Crafts	1	
Metal Working		
15 Machine Shop	25	
16 Tool Making	5	
17 Die Making	1	
18 Light Iron Work	2	
19 Forging	14	
20 Blacksmithing	3	
21 Founding	8	
22 Sheet Metal	7	
23 Cornice and Skylight	1	
24 Steam Fitting	2	
25 Plumbing	10	
26 Instrument Making	1	
Engineering		
27 Electrical	1	
28 Steam	3	
29 Gas	1	
30 Operating Steam	1	
Electricity		
31 General Electricity	3	
32 Wiring	3	
33 Practical	1	

Subject	Industrial Work Frequency	Supplementary Work Frequency
Masonry		
34 Tile Setting	1	
35 General Masonry	1	
36 Brick Laying	10	
37 Plastering	4	
Academic Work		
38 Arithmetic		8
39 Algebra		4
40 Geometry		2
41 Trigonometry		4
42 English		3
43 Grammar		1
44 History and Civics		1
45 Geography		2
46 Chemistry	2	5
47 German		1
48 Mechanics		1
49 Physics		4
Household Arts		
50 Sewing	23	
51 Cooking	19	
52 Millinery	12	
53 Dress Making	9	
54 Laundrying	1	
55 Housekeeping	1	
56 Hand Machine Sewing	1	
Horology		
57 Jewelry	1	
58 Optics	1	
59 Watch Making	1	
Textiles		
60 Tailoring	1	
61 Button Hole Making	2	
62 Cotton Spinning	1	
63 Wool Spinning	1	
64 Worsted Weaving	1	
Art Work		
65 Sign Painting	3	
66 Art Leather	1	
67 Clay Molding	2	
68 Plaster Casting	1	
69 Stone Cutting	2	
70 Painting and Decorating	11	
71 Free Hand Drawing	1	
Automobile Work		
72 Automobile Management	2	
73 Chauffeuring	1	
74 Automobile Body Work	1	
75 Automobile Painting	1	

Subject	Industrial Work Frequency	Supplementary Work Frequency
Miscellaneous		
76 Hygiene and Sanitation	4	
77 Printing	1	
78 Agriculture	3	
79 House Painting	1	
80 Book Binding	1	
81 Gasoline Engine Practice	2	

Some General Observations

With the present state of knowledge and school organization comparison of one school with another is not possible as schools differ so widely. However, a few general tendencies may be pointed out.

We can say that the median cost of industrial education is $4.80 per pupil per month with a variation of 126 per cent of the median. In general the proportion devoted to teaching and supervision is nearly the same as in the common schools, being about 73 per cent of the total expenditure. There is a greater variation in cost per pupil in the industrial schools than in the common schools. There is a greater diversity of subject matter in the industrial schools, the table showing that there are about 80 different subjects represented in this report.

To be able to secure accurate, complete information, better methods of bookkeeping will have to be introduced. Schools should be able to distinguish between salaries paid to teachers and to janitors, and where schools are a part of a city system there should be methods by which the expenditures of one school may be distinguished from those of the others.

There also should be established some standard form of making reports so that there will be some common basis of comparison among the various schools. Under such a system, for example, there would be no occasion for reporting 45 per cent of the budget as miscellaneous expenditure.

As schools differ radically in organization and function specific data on the separate courses would be very valuable, especially to those contemplating the introduction of new lines of work in connection with their schools already established. Data of

each department together with the data on general maintenance should be accurate and reliable. Although this study is incomplete and, in a number of particulars, only of relative accuracy, it may be of value in pointing out tendencies.

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PREFACE

The purpose of this study is to present a survey of contemporaneous tendencies in the teaching of spelling. It is a summary of the situation in which the elementary teacher finds himself, with some explanation of the forces, traditional and radical, which have moulded it. No attempt is made to deal with every controversy or problem; space would not permit. Merely the more important factors have been analyzed, for these establish the structure of our difficulties. When these are understood the lesser problems find a ready explanation.

Our traditions are frequently very insistent. Often a single mode of teaching will completely subordinate other supplemental means. No less dominating is reform, with its passion for the particular idea to which it has attached itself. The result is that teachers standing in the midst of many practical pressures, are not always able to comprehend the situation as a whole, to view each particular tendency in its relative place and complete setting. This review is designed to offer the necessary perspective. It outlines the major controversies, traces their recent evolution, and gives some critical estimate of their worth.

The whole effort of the study is to study a live situation, for institutional customs have an active moulding power. Lay a wide reform upon the school, and the result will always be somewhat disappointing to the reformer. The tradition upon which reform has been laid is not static; it has force and modifies every new idea. There are lines of most and least

resistance in every institution and these must be taken into account in any progressive policy, for history is not the past devitalized at the present; it is the future in germ and about to be projected. For this reason, the historical method is used throughout. Nothing illuminates the present as an understanding of immediately preceding situations. Any basic interpretation of to-day's practices is dependent upon a comprehension of yesterday's.

If the basic method emphasized is historical, the critical method of the philosopher of education has been everywhere superimposed. For mere facts must be evaluated, expressed in terms of their significance for the school's purposes and given a relative worth in the whole scheme of teaching methods. Hence modern sociology and psychology, and the other studies from which education gains its partial scientific criticisms and sanctions, have offered standards for measuring the worth of classroom teaching. And then, too, the philosophy of education, just because it views education as a whole from norms erected by its own situation, reveals many inconsistencies, overemphases, and false relations, readily perceived if the elements of the situation are seen in their total setting. Hence the study goes beyond a simple historical tracing of particular methods and a descriptive statement of the manner in which these are operative in the present. It is constructive in that it suggests the particular function of each method and the manner in which these are to supplement each other in the whole work of instructing children in spelling.

Inevitably the gaps in our knowledge are revealed. Not all the experience we have can interpret the whole story. The empirical discoveries of the teacher, presented in pedagogical tradition, and the criticisms of the analysist, stated in current theory, fall short of completeness. There is need of a more minute and accurate evaluation of teaching methods which only the experimentalists in teaching can give us. For them this study will have worth. It will point the issues which are of practical concern and suggest the definite bits of truth which must be known before we can progress rationally. It is far better that the educational psychologist and the comparative experimentalist in teaching study the issues which are real

to the professional teachers. His results will then be more readily heeded by the great masses of teachers, for the facts revealed by his inquiries will be eagerly received and applied.

It is hoped, therefore, that the monograph here presented will assist in the improvement of our methods of teaching spelling: (1) directly, by giving a wider comprehension of the tendencies now effective in our spelling situation; and (2) indirectly, by suggesting a series of practical problems that require the scientific contributions of the experimentalists in teaching.

H. S.

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CHAPTER I

THE NEED TO STUDY OUR INSTRUCTION IN SPELLING

Our teachers are peculiarly sensitive to the misspellings of their pupils. In geography, history, or mathematics they are fairer to themselves and the children in making allowance for inevitable imperfections in the results of their teaching. In spelling they forget that their pupils are not grown but growing; and a lapse or error becomes a source of exaggerated discouragement or irritation. The careful teacher feels a pang of conscience with every misspelled word and even an indifferent teacher is somewhat disturbed into a sense of shortcoming, if the errors called to his attention are those of spelling.

Our Sensitiveness to Spelling Defects

It is probable that this professional sensitiveness regarding spelling is due to the fact that lay criticism focuses itself more readily upon defects of spelling than upon those of other school subjects. Next to the complete inability to read, poor spelling is to the public the surest sign that one is not educated. One may miss the meaning or pronunciation of a word in reading, and it will be forgotten the next moment; the impression is transient, as attention is rapidly carried along to something else. Let a word be misspelled and the incompetence is recorded as a visible and more or less permanent proof of defect. Hence a poor speller is the first and readiest discovery of the layman. The lay critic, being human in the forgetfulness of his own youthful errors, easily thinks that the children of his own generation were better taught; he then lays the lash of odious comparison upon the present teachers. This criticism is usually ill founded, for such accurate comparative information as we have indicates the superiority of the actual results attained under

modern methods of instruction in spelling. Nevertheless the criticism is terrifying.

Resulting Complexity of Methods

The result has been that an energy and ingenuity has been expended upon the teaching of spelling that is quite disproportionate to its relative place in life and the school curriculum. A decade or so ago this over-emphasis expressed itself mainly in an energetic increase of drill, review, and examination; to-day it shows itself mainly in the effort to invent and utilize better methods of presenting and correcting spelling words. Many new modes of teaching children to spell have been devised; old methods have been dragged from the historic scrap-heap and revived under both old and new names. Contextual spelling, development through multiple sense-association, and phonogrammic classification of words are among the newer ideas introduced; while the spelling match, diacritical marking, and word analysis represent the restorations. Amid all these methods, new and old, representing an unusual complexity of teaching device, it is difficult for the old teacher, much more for the young teacher, to steer himself. That there is necessity for the evaluation of spelling methods is manifest in the pedagogical confusion that exists in the works of text-book writers, the practice of teachers, and the discussions of theorists.

The Need of Evaluation

The whole situation requires careful analysis in terms of classroom experience and investigation under experimental conditions if the relative worth of various systems, methods, and devices of teaching is to be determined. The obligation for clarifying the situation rests upon the practical methodologists of progressive and investigative turn of mind, wherever these may be found throughout the country. They will need to study our prevalent methods of teaching spelling by every approach; to note their genesis in terms of the various traditions and forces which have originated and moulded them; to compare the uses and effects of various teaching procedures under differing situations; and finally to measure the efficacy of our present

methods, general and special, by standards of scientific construction.

A Preliminary Survey of Present Methods

But before we can reach the all-important stage of a scientific investigation of spelling methods by an experimental teaching that will test their relative efficiency, we must know what our spelling situation is. Description and analysis normally precede experimentation; they reveal the issues upon which current theory and practice express differences of opinion. To describe the status of teaching in spelling we shall need to know the methods in current use, to note the manner of their introduction, the extent of their adoption, the special problems they were designed to solve, and their relation to other methods of instruction both supplementary and competitive. We must also render such broad estimates of worth as are apparent to the experienced analytical observer; and finally reveal the important controversies that call for experimental solution.

CHAPTER II

THE CHANGED STATUS OF SPELLING

It is obvious to any careful professional observer that the status of instruction in spelling has greatly improved within a quarter of a century. An increase in the types of teaching employed for both old and new purposes has been a source of fruitful selection. Old methods have given way to new or have persisted against innovations that had less logical claim to success. Among the many devices and methods there has been a struggle for existence on the basis of fitness and for the most part only the better of them have survived. There has of course been much accompanying waste of which we must now rid ourselves. But the fundamental factors in the right teaching of spelling may now be said to be fairly well recognized, at least in degree sufficient to guarantee their extended application. It is the major changes in the aim and spirit of spelling instruction which are reconstructing its details of method. It is therefore useful at the outset to know in a broad way the larger tendencies toward change now current among teachers.

Teaching Subordinates Testing

A quarter of a century ago the spelling period was given over to the mere hearing of spelling lessons. The teacher heard the children spell the words that had been assigned for mastery, and made the corrections as the errors occurred. More often the children wrote the words in lists as the teacher pronounced them. An oral spelling by the teacher afforded the basis for marking misspelled words. A new list of words was then assigned for the next day's lesson without much anticipation or preparation for special difficulties. Correction on the part of the erring child consisted in writing the misspelled words a specified number of times under scant supervision after school

or during a study period. The so-called class lesson in spelling was really a daily examination in spelling. Under such a system the learning of spelling was a matter for home assignment and individual study. The class exercise was purely for the purpose of testing the child's knowledge. It did not devote itself either to the careful presentation and development of new difficulties or to the watchful correction of child's errors. In all its emphases it was primarily a test rather than a lesson.

To-day, the use of the class exercise in spelling is vastly different in most places. The teacher spends his time carefully presenting a few words, rather than in examining on the child's ability in many. New work is a matter of class study, where words are presented with unusual artfulness in order to suggest their meaning naturally through circumstance or context. Every effort is made to safeguard the child against a wrong first impression and an incorrect learning of the word. If a home lesson is assigned, it is not a mere mapping out of the number of words to be learned; the assignment is an exercise in which the teacher uses all his foresight in anticipating the various kinds of troubles the child will meet, focusing the attention on special difficulties and suggesting modes of self-instruction. The modern spelling exercise may test the child's knowledge, but its primary function is to instruct rather than to examine. Here testing is a mere accessory of instruction and completely subordinated to it.

Prevention Supplements Correction

As might be implied from the foregoing, the earlier teaching was primarily looking for error, which it promptly assumed to correct, though it performed even this task loosely, as we shall later see. As emphasis was laid on a test of the child's knowledge, it was necessarily corrective in spirit. To-day teaching in spelling aims to get rid of error by anticipating and preventing it through a watchful supervision of first impressions and associations. This is the significance of the shortened assignment lists, the elaborate development of the meaning and form of words, and the multiplicity of devices for interesting the child in the right observation and use of words. Even the correction of spelling errors has grown more efficient under its companion-

ship with a skilled teaching which aims to avoid all unnecessary error. Correction no longer stops with a check mark and a reprimand; it inquires into cause, and follows up the pedagogical correction, making certain that recovery from error is complete. The corrective work is done with a spirit and thoroughness designed to prevent the recurrence of the need of correction.

Vital Instruction Supersedes Formal Work

What could be more dreary than to spell lists of words utterly unrelated to each other and devoid of vital significance to the child? Such a task must have been to the child what learning nonsense-syllables is to an adult. The gap between the child's need to spell his own words and the adult's demand that he spell certain others is now much better bridged than before. To begin with, the first spelling that the child undertakes is to translate his own speech into sight symbols so that another may read his thought. When spelling instruction becomes more systematic, words outside the child's active vocabulary are not directly imposed. They are brought in indirectly. He is given the experiences that bring the new terms into his life as appropriate symbols for his new thoughts, feelings, and deeds. He is stimulated to speak of these new pilgrimages into knowledge and to write of them. Then the spelling of a word that was very strange yesterday is no dull task; it is the acquisition of a technique, as necessary from the child's standpoint as from the adult's. Such is the changed spirit of spelling instruction in our schools. It has become a vital, well related business where before it was unmotivated and isolated; it is now real where previously it was formal.

Change in the Type of Motivation

One can well imagine the type of motivation used under the older methods of teaching spelling. The words were too frequently related to the child merely through the teacher. The child did not feel any direct relation to the word, but he did to the teacher. His dependence upon the latter was obvious. He learned the spelling word in order to get along with the teacher. The teacher thus became an end in education, not

a means. It is easy to see the type of motivation which would be developed in such a situation. It was coercive and harsh, emphasizing all the qualities of mind that accompany subservience to a master, or rivalry with one's fellows.

The value of much of the spelling was extrinsic not intrinsic. And the extrinsic worth of spelling to the child was not fundamental, but adventitious; it referred not to his permanent ability to express himself, but to his transient and conventionalized relation to the teacher. The glory of success in the competition of the spelling match typified the kinds of motives used to stimulate the good speller; the deprivation and shame of being kept after school were indicative of the deterrents which kept the poor speller from an utter neglect of the spelling book.

It would be well if we could say that all this has changed. It has not yet done so with any completeness in current practice; but in spirit and in policy we have already come into a ready acceptance of the standard that good instruction in spelling depends upon improving the quality of motivation. Practical teachers no longer argue that the spelling period should not have a content of its own. This is debated only where the problem is still academic. The original demand to spell a word may come from outside the spelling period, but the teacher through the introduction of proper basic experiences in the spelling lesson will try to create a demand for the word then and there. Thus the spirit of naturalism which is slowly driving artificiality out of the schools is, with the artistic teacher, making spelling vital to the child. There is now interest wherever spelling is well taught; the children are active not dull, eager not driven.

Spelling Reflects General Educational Progress

These changes in the spirit of instruction in spelling are largely reflections of general progress in teaching method. Spelling within the domain of its own special method has been a follower rather than a contributor. It has even been tardy in its followership. But this is to be expected since spelling is a secondary subject in the curriculum; for one does not need to spell till one has something to say and wishes to write it. Log-

ically, or psychologically speaking, spelling as a subject makes a tardy entrance and an early withdrawal. In this respect it is like that other subordinate subject—penmanship. For this reason the progress and status of instruction in spelling are largely determined by its relations to other subjects, more particularly in recent decades to reading and written expression. Hence we have the need to trace the relation of spelling to the other subjects.

CHAPTER III

THE RELATION OF SPELLING TO OTHER SCHOOL SUBJECTS

The Early Connection of Reading and Spelling

In the beginning the subject of spelling was closely associated with the subject of reading, a relation somewhat difficult for the modern trained teacher to understand since spelling, like penmanship, is a technical equipment made necessary by the demands of written expression. The connection is explained by the history of the school curriculum and methods of teaching during the Colonial Period. The first schools were really reading schools, founded that children might read the Bible and understand the word of God. The method by which early reading was taught was the spelling or alphabetic method; and down to the early part of the nineteenth century the school regulations called for teaching children to read "by spelling the same," that is, through learning the alphabet and spelling the letters of words so as to approximate the sound of the word.

Its Influence

This early association of reading and spelling had far-reaching influences. It biased the content of spelling. The materials of the latter subject have always been drawn more frequently from reading than from other school studies. In addition, the early methods of using the alphabet to teach reading were soon fastened on to the teaching of spelling. There they have persisted. One has only to mention oral spelling, diacritical markings, and syllabication as devices used both in beginning reading and in formal spelling to note the connection. When reading and spelling resumed partnership, the influence of reading material and methods on spelling became dominant again.

Spelling as a Separate Subject

A little later spelling is differentiated from the subject of reading, largely because of the appearance of spelling books which gave it more or less of an independent existence as a formal subject. This position was maintained throughout most of the nineteenth century. While its content had been determined mainly by the matter that children had read at school, its new character as a group of dictionary lists increased its independence; and spelling was taught without much reference to its relation to the other subjects studied at school. It had reached its extreme place as an independent discipline, and in consequence was less vital in its selection of content and more formal in its methods than at any other period.

The Movement for Correlation

Toward the end of the last century the advent of the general pedagogical movement which was correlating each subject with every other, had its influence upon spelling along with the rest. But the influence upon spelling was more lasting than on any of the other subjects, largely because spelling had attained an unusual independence and formalization, less warranted perhaps in the case of spelling than of other studies. The more enthusiastic of these correlationists argued that spelling had no content of its own and that it should receive its materials from other subjects. Hence, geography, history, grammar, arithmetic and science made their contribution of words to the spelling period along with reading. Others went so far as to propose that the spelling period be abolished and all necessary spellings be taught "incidentally" during the other class periods.

These radical measures which were the inevitable influence of the teachings of the American Herbartians could not gain a wide acceptance, nor did they endure to any extent among the enthusiasts themselves. Recovering from its limited obliteration and its temporary subordination, spelling once more resumed considerable independence as a school subject. But the temporary domination of other subjects over spelling was influential for good. Never again has spelling become as formal as it once was.

Its technique has come into relation with the situations requiring it, and spelling has been taught more vitally ever since.

The Present Relationship

If the pedagogical principle of correlation broadly blazed the way for the more accurate relating of spelling to other subjects, an important quality in characterizing its present status, it remained for psychological analysis definitely to point the manner of its achievement. The present-day view is that spelling as a school subject is vitally dependent on written composition or expression. The child's need to spell is directly called into existence by his need to express himself in written symbols. The domination of reading over spelling is purely a historic incident that persists influentially in pedagogical tradition. The school child of to-day may read without knowing much about spelling. The smaller vocabulary of written composition rather than the larger one of reading should set the task of spelling. In theoretic acceptance spelling is therefore psychologically subordinate to written composition, and all the better movements toward change in the relationship of spelling with other subjects point in that direction.

In actual practice this theoretic status is not fully realized. The ordinary teacher finds it difficult to break with tradition, and the text-book maker responds rather intimately to his market. The latter has, too, the difficulty of prearranging subject matter and becomes a further brake upon progress. It is not surprising therefore that spelling books have been modified slowly. They still go their traditional way, but not as much as before. The other subjects have modified their vocabularies, the subject of reading most of all. In the meanwhile, the average teacher with consistent progress modifies what is given him by adding words from the spontaneous work of the composition period.

CHAPTER IV

THE SELECTION OF SPELLING MATERIALS

The source of the words taught in the spelling periods has been largely suggested above. The changing relationship of spelling to the other school subjects unavoidably affects the spelling vocabularies utilized. But a further view of the matter is necessary in order to indicate the more detailed influences which determine the selection of words for study.

The Importance of the Text-Book

Ideally speaking, the words of first import to a child are those he needs for his spontaneous written compositions. In practice the school cannot make as fine adjustments as such a theory would suggest. Just because school teaching is a systematic business it must proceed by some plan, in more or less of a formal way. This does not at all imply that its forms of procedure must be artificial rather than artful or artistic. As all children do not have the same needs, and those they share do not occur at the same moment, the school strikes a compromise and uses a plan of its own. In consequence, the material laid down by the course of study and the adopted spelling text really determines the words used by the greater number of teachers. In most courses of study the speller is the course. For this reason, the manner of text-book making is an important element in understanding our situation.

The Influence of the Earliest Spellers

That many of the first texts in spelling were "desk-made" seems obvious to one who examines them. They certainly were not mainly determined by school-room experience. In fact, laymen frequently wrote spelling books, mere philological erudition being regarded as a more important qualification than experi-

ence in the primary school. Such authorship would not commend a manuscript to a publisher to-day. These books naturally imposed adult standards in the selection of words and disregarded the child's use of them. The words were more likely to be taken from dictionaries than from school subjects. Such classifications as were given to the material represented an adult logic, and the grading of words was mechanical rather than psychological, the difficulty of a word being largely measured by the number of syllables it contained. On these initial wrong assumptions the first traditions of the spelling book were established. And the traditions have become stubborn; only slowly have they given way.

The difficulty with our spelling books is that they are descendants of each other, a new book being a modification of an old one. Even teachers of long experience have not essayed to utilize their first-hand experiences as more important determinants than established convention. This accounts for the persistence of "desk-made" books even when teachers with wide practical experience write them. Words which children and ordinary people never use are still included, and they are classified and graded after schemes that do not even approximate any real child's needs.

Books Based on Classroom Trial

It is not until we come within a decade or so of the present day that the laboratory test of classroom use is applied to spelling lists. It cannot be said yet that it is demanded by teachers; it is offered as a recommendation by authors and publishers under the pressure of sharp competition in book adoptions. The prefaces of recent spellers contain such statements as the following: "This speller has been in successful use for a number of years," or "The words in this speller have been selected from lists supplied by principals and teachers in the schools of six cities," or "The words given in each grade have been thoroughly tested by a large number of teachers." Publishers of school texts have been known to publish advance texts for a year's trial in the classroom prior to the publication of the sale edition. The influence of such empirical standards has been marked, particularly in eliminating words of infrequent

usage, in reducing the number of words included, and in classifying and grading words according to the interests and capacities of children.

The Need of Investigating Adult Vocabularies

It cannot yet be said that investigations have been conducted to show which four, five, or six thousand words are of most frequent usage among adults whose vocational station in life is determined by the fact that they have not gone beyond the first eight grades of school. We do not yet know with any show of accuracy which of these are seldom misspelled and which are persistent sources of error among large numbers of people. Our social standard is merely an inaccurate tradition of the spelling-book makers, somewhat modified by the personal judgment of the particular authors and the protests of teachers who compel some revision. We have still to achieve a careful investigation into the vocabularies of adult life which set the spelling demand and give us our problem.

Supplementary Spelling Lists

While the domination of text-book material has been large in the spelling period, it must be said that it decreases. Texts are now so frequently supplemented by word lists made by the individual teacher in the instruction of his particular class that the sources of these supplementations should be stated. These additions are of three types: (1) grade lists, (2) class lists, and (3) individual lists.

Grade Lists

Teachers of particular grades within a single school system frequently build up more or less permanent lists from the various text-books used in the course of study for their particular grade. The mastery of these words in advance of or parallel to their appearance in the normal course of instruction is chiefly preparatory and preventive. Growing out of the teacher's experience of actual spelling needs with the course of study as it is, such grade lists afford a much more vital and efficient series of words than the speller. The speller is an adjustment to

country-wide conditions; the grade list to a particular school system with a fairly uniform course of study.

Class Lists

In addition many individual teachers maintain class lists composed of difficult spellings and actual misspellings which occur among a considerable number of the class in the course of their written exercises. If the children ask how to spell a word for which the teacher has not provided, the word is spelled for them and then assigned to the next spelling lesson. The children keep regular blank books for such words as are thus assigned. Children are not allowed to guess at a spelling; they are told the spelling or asked to go to the dictionary, and the fixation of the word is tested at the next recitation. The same method of treatment applies to misspellings corrected in the class periods assigned to other studies. Thus the correction of special class errors in spelling is efficiently followed up. Such lists are reconstructed with each year, though the materials of different years afford a source of selection for grade lists.

Personal Lists

In addition to the grade and class lists there are personal lists for each child, usually kept in the same blank book as the class list. As a child writes on any subject, particularly in English composition, he is encouraged to write down (1) every doubtful spelling for later investigation and mastery, (2) every word the spelling of which has been told him by teacher or classmate, and (3) every word that is marked as wrong in the work returned to him. To recruit further words for individual needs a special exercise is sometimes given in the form of spontaneous spelling lists. Each child writes all the words he can think of as rapidly as possible. The misspelled words are then corrected and placed on the personal list. This is not so good a source as the day to day contribution which comes from the written exercises of the language period, but it supplements it. These personal spelling lists are then frequently checked up by the teacher. The personal spelling list is the finest adjustment of materials that the school can make. It represents a

provision for individual variation which is quite remote from the crude adjustment of the spelling book material.

The source of spelling words has thus greatly improved. It has more and more provided words that the child needs; less and less imposed little used words that have no significance for him. Spelling has come to deal with the child's real spelling needs no matter in what subject they occur, but more particularly with those that arise in connection with written composition. The adjustment of word-lists to individual needs has *become more refined;* the spelling book's broad guess at need is, in the case of the progressive and industrious teacher, supplemented by grade, class, and personal lists. And finally, spelling grows more preventive in its methods while it increases its vigilance in making and following up corrections of misspellings.

CHAPTER V

THE GRADING AND CLASSIFICATION OF WORDS

The standards which have determined the composition of spelling lists to be taught to all children are the school's rough approximations to the actual social demand which says that each child should know how to spell the words in most frequent usage among ordinary adults. Rough as these approximations are they are a recognition of the social factor in the construction of the course of study in spelling. In so far as spelling materials are to be selected and rejected, it may be said that our problem is primarily sociological; in so far as they are to be graded and classified in adjustment to the child's point of view and ability, it is psychological. Having given some statement of the actual way in which spelling words have been selected, we ought now to be concerned with the manner of their arrangement in texts and teaching. We have then to consider the grading and classification of spelling words.

Grading by Number of Syllables

The first spellers graded spelling words in terms of their difficulty, their supposed difficulty being determined by the arbitrary numerical method of grading words according to the number of syllables they possess. If the word had a few syllables, it was easy; if it had more, it was harder. So long as irregular words were excluded from such lists, this method of grading spelling words did well enough. But the pressure of actual schoolroom use inevitably tended to introduce words that children were using, quite regardless of the fact that the correspondence between the pronunciation and the spelling of a word was imperfect. Children would try to write the words of their ordinary speech, and their words came into spelling lists slowly but surely. The appearance of such irregular words at once exposed the fallacy of grading merely by syllabic length.

An irregular word of three syllables might be more difficult than a regular word of five. And the observant teacher must frequently have noticed that a child, wishing to spell an irregular word useful to him, might learn it more readily than he would an allegedly simple and regular word, imposed on him by the spelling book, when he did not know its meaning and consequently felt no spontaneous need for its use.

New Bases of Classification

The result was that two new bases of classification tended to supersede the old syllabic gradations. In increasing degree words were classified (1) by their common structural or phonetic elements, and (2) by their associated meaning or use. The first basis of classification is illustrated where words having a common sound are grouped within a single lesson. The second basis is exemplified where the lesson is made up of the specific names of objects belonging to the same general class.

Classification by Structure

The first of these bases of classification seems to hold priority in the development of spellers. This might well be expected, since grading by syllables was a structural classification of a somewhat simple sort. It gave an impetus to the grouping of words by phonetic structure. The introduction of needed irregular words only refined and differentiated the classification by phonetic structures. Words were grouped on the basis of common sound elements—vowel, consonant, diphthong, or digraph. Thus words are put in the same group when they contain a letter *a* which has the sound of Italian *a* (hark, palm). Again words are put together on the basis of sound equivalence regardless of the varied spelling of the classifying sound (dairy, day, great, inveigh, they, gauge, gaol, aye). On the same principle homonyms are taught together (their, there; too, two, to).

The principle of classification by common sound structure finds its most recent and enthusiastic revival in the grouping of words by common phonograms (action, fashion, region; enough, rough; fight, light, sight; urbanity, humanity, sanity). Such

grouping of common regular elements in words is a modern substitute for the older method of syllabification.

Classifications by Meaning or Use

The second basis of classification is not so formal, as it is concerned with the association of words through their meanings or uses. It is a very common practice of spelling books to group together words standing for particular things within a general class. Thus, *polo, tennis,* and *golf* would be classified together under *athletic games,* and *drum, fife,* and *bugle* under *musical instruments.* The study of groups of synonyms (blame, censure, convict, denounce) and of pairs of antonyms (ratify, abrogate; conquer, surrender) are arrangements made upon the basis of meaning. Less frequently, words are classified according to their uses as when the entire lesson consists of adjectives, nouns, or participles. Here the grammatical use suggests the meaning only in a very broad and vague way. These classifications in terms of meaning and use represent the first attempts to get content into isolated spelling words by natural association. In so far as words were given any meaning, in a prior period, it was done by formal definitions. That grouping of words by meaning and use which is most modern is the spelling of words in the context of sentences and paragraphs. Here the words assigned for a first spelling lesson appear in their normal context and grammatical use as parts of interesting sentences. Spelling from dictation or in spontaneous composition is the latest arrangement of spelling words in terms of meaning and use.

Classifications upon Both Bases

There are many classifications of spelling words which do not fall completely under either of the types mentioned. They represent classifications upon mixed bases, taking into account both structure and meaning. Sometimes one factor or the other plays the most important part, though both are present. Thus classifications of words by common prefixes (improper, impolite), common suffixes (audible, visible) or common stems (export, portable) suggest common meaning and structure by virtue of their similar derivation. When singular and plural,

masculine and feminine, nominative and possessive forms are studied in relation to each other we have a similar case. They carry an association through meaning, in order to focus attention on the variation in form. The same is true when words and their abbreviations or contractions are studied.

Thus from simple alphabetical spelling, syllabification, and the verbal definition of words, our grading and classification of spelling words have gradually passed to more varied methods of grouping in terms of meaning and use. The bases of grading and classification now in use are many. Frequently they represent mere duplication of means, but more often they add to the richness of our teaching methods, one device supplementing another.

CHAPTER VI

ASSOCIATING MEANING, PRONUNCIATION, AND SPELLING

The Three Factors to be Associated

Ability to spell includes more than the power to recite in their conventionalized order the letters composing a given word. It involves an accurate command of that fact in connection with two others, namely, meaning and pronunciation. A group of words is never well taught unless somewhat within a spelling period, or a series of periods, the teacher makes certain that the pupil has (1) its meaning, (2) its pronunciation, and (3) its spelling. And these three factors must of course be known in proper association.

It is altogether possible that the teacher may not have to develop each of these factors. The word may have been learned elsewhere and may have become part of the child's oral vocabulary,—which is to say that the child has already associated its meaning and its pronunciation but not its written form. But the conscientious teacher cannot assume that this is so. He must test the fact. The failure to do this registers itself most conspicuously in the poor results obtained with children of foreign birth, who have not the English speaking child's oral basis. If the child knows the word for the purposes of speech, then the teacher has only to develop the order of letters composing the written symbol, and to associate that fact with the already acquired meaning and pronunciation. If the child does not know the word at all then the teacher must begin his work at the foundation, and (1) develop the meaning of the word through experiences of active, objective, or some other intellectual kind, (2) make sure that the pronunciation is thoroughly acquired as a by-product of this first activity, and then (3) develop the proper spelling in association with the word's mean-

ing and sound. Only by a firm insistence upon the inclusion of each of the three factors within the teaching procedure can we make our instruction in spelling competent.

Formal Work Neglects Meanings

Too often in the past, when spelling was regarded as a formal subject, pronunciation and spelling have been associated to the neglect of the meaning of the words taught. The development of alphabetic, phonetic, syllabic, and phonogrammic methods of teaching words, along with every other device of classification or procedure which emphasizes the relation of sound structure to sight structure, tends to subordinate the use and the significance of the words, if it does not omit them altogether. Too much emphasis on the mechanics of spelling makes the instruction formal precisely because it isolates these sound forms and visual forms from the meanings and uses of the word.

The Newer Methods Correct this Neglect

In so far as the newer methods of teaching spelling avoid overstressing the formal structures of words and treat them in the largest possible units, the tendency toward a false emphasis is decreased. Syllabic and phonogrammic spelling of regular words seems better than a phonetic letter treatment. And dealing with irregular words as wholes, to be associated without sub-division, moves in the same direction.

The reform is more than negative and corrective, however, for many of the present methods of teaching are calculated to enhance the content side of spelling. Supplementing list-spelling by contextual spelling, and the definition of words by actual experiences in the use of words are instances in point. A similar result is accomplished by the recent insistence on conversational and other oral work as an introductory basis for formal spelling.

Inadequate Presentation of Essential Factors

Many of the traditional methods having a widespread present acceptance are assumed to present the appropriate meaning, pronunciation, and spelling desired, when in reality some inadequate substitute is given in its stead. Three illustrations will suffice

to make the criticism clear, without encroaching on the more detailed discussions which follow.

It is frequently the case that teachers give children a definition of a word, assuming that by that act they have acquainted the child with its significance and use in a dynamic way. The child may merely memorize the words of definition as an addition to the memorized order of letters, and the slovenly acceptance of this apparently proper use of the word in a sentence (which is often ambiguous) fails to catch the defect of the original teaching.

In the case of pronunciation, failure of this sort is less likely to occur, because classroom exercises are so largely oral that improper pronunciations may quickly be found out and corrected, even if badly taught. The exclusive use of written spelling from dictation by the teacher, while making some provision for the presence of the spoken word, may not do so in sufficient degree. We know how often in life we understand a spoken word that we ourselves cannot pronounce. The teacher must not assume that the child knows how to pronounce a word merely because he has appreciated its meaning and written it correctly. Some oral response upon the part of the children themselves should be provided. Our tests are too frequently written. The old fashioned spelling matches and other oral recitations (where the word is pronounced before and after spelling) have a marked advantage over some newer modes of written instruction.

If the use of oral spelling with pronunciation has its advantage in guaranteeing the right sound interpretation, its exclusive use is defective as a means of conveying context. Perfect oral spelling of unrelated words in lists, one of the old style ways of teaching, does not assure us that the child will spell the same words perfectly in his spontaneous written compositions. Oral letter spelling is primarily an association of sound with the motor activity of the throat; written spelling is mainly an association of a visual whole with certain muscular activities of the hand. They may or may not imply each other. Again, words in isolation, spelled correctly with full attention upon them, may be readily misspelled in the midst of the distractions of real written expression, where the pupil's thought, not his spelling technique, is the main thing on his mind.

The Need of Skepticism as to Special Methods

Teachers need to be cautious when they assume that a given exercise in spelling has developed meaning, pronunciation, and spelling in a real way. Each special method mentioned above probably has its advantages for the purposes of teaching, but its disadvantages are also obvious to anyone who will analyze the method closely. It is improbable that any one means of teaching spelling will be adequate alone. We need to be suspicious of systems based on one idea, here as elsewhere. It is far more probable, upon the basis of what we already know from analysis and without the more incisive aid of experimental investigation, that many methods will be required in order that the weaknesses of one mode of instruction may be corrected by others. At any rate, teachers should be skeptical of the loose assumptions of both traditionalists and reformers, and insist upon a close examination into the fitness of teaching means to attain specific pedagogical ends.

The Proper Sequence of Association

It is not enough to have each factor properly developed by itself and then related to every other. Use establishes an efficient sequence for the associations acquired in the spelling period. The normal sequence employed by a first or second grade child when spelling a word would be to proceed from the sense of the situation to its oral expression, and then to its written expression. Of course no such slow, orderly succession of stages is apparent, but something of this order of procedure is characteristic of the quickest associations. Lessons in spelling may fix these associations in quite the opposite and unnatural order. It is not unusual even to-day to see children copying meaningless words from the blackboard, repeating their pronunciations after the teacher, and then discussing their definitions with him. One text-book writer approximates, though he does not fully fulfill, this distorted order when he says that the best sequence in which to teach spelling is as follows: (1) Pronounce the word, (2) spell it both by letter and by word, (3) discuss the meaning, and (4) use the word in a sentence.

Of course the teacher may for convenience take up the various factors in spelling in different orders for special and transient purposes of his own. But he is bound to correct and supplement them, and finally to leave a total impression upon the child which is normal to his uses.

The Method of Multiple Association

But such concrete practices as I have cited are probably great improvements over the older teaching. There was no real order of activities in the older teaching because oral spelling or written spelling was merely repeated throughout the recitation period. The gain of modern teaching rests in the fact that it takes more versatile care of all the factors involved in accurate spelling within a short space of time, within a single recitation, and even within a unit of movement in the class exercise. One thing is certain, modern teaching is richer in the associations it brings to spelling. It not only teaches a fact but it does it in many vital ways. It uses the principle of "multiple association." It develops the meaning through definition, the context of written sentences, discussion, and the personal experience of action and observation. It utilizes every channel of appreciation and expression in associating the form of the spoken and written word; the ears hear, the eyes see, the voice mimics, and the hand copies the form of the word—all within the minute or two involved in the first presentation of a new word. Fullness of association, richness of connotation characterize the child's possession of the newly learned word.

In no other aspect of spelling instruction has there been more improvement than in the methods employed to associate the necessary factors of meaning, pronunciation, and spelling. The improvement is largely one of enriched resources. It cannot be said as yet that the average practitioner makes a discriminating use of them. At present he is likely to be confused by the numerous and complicated means at his disposal. Nevertheless the wide range of methods we now have has already given, (1) a fairer emphasis to each of the factors essential to good spelling, (2) developed more useful ways of comprehending them, and (3) fixed them through vital and numerous associations.

CHAPTER VII

TEACHING THE MEANING OF WORDS

As spelling has improved in its methods of teaching, it has steadily given a larger place to the development of the meaning of words within the spelling exercise. A progressive teacher of the present day will have almost as much vital experience for the child in spelling as in geography or history.

Dependence of Early Methods upon an Oral Vocabulary

In the beginning, the pedagogical practice of the spelling period seemed to assume that the child already had the word to be spelled in his speech. And the assumption was approximately true as long as spelling was dominated by the traditions which made it an activity closely connected with writing and reading. The writing exercise called for meanings and words the pupil possessed in all respects save in the ability to spell. The reading exercise developed the meaning and pronunciation, leaving the writing of the visual symbol to the spelling period. If this tradition and practice had endured, the failure of formal spelling would not have become apparent so soon. But two causes operated to reveal the inefficiency of formal spelling. One was the change in spelling vocabularies; the other was the appearance of a heterogeneous school population.

Causes Operating to Force Content into the Spelling Period

It has already been noted that with the appearance of special spelling books, spelling detached itself from reading and writing and became an independent school subject. The spellers became a collection of dictionary lists, and words were taught which had little to do with the child's personal or school needs. In consequence he was put to the acquisition of spelling words that

were not within his oral vocabulary, and he tended to learn them superficially because the spelling period gave practically none of its time to developing a content and oral basis for the spelling of words.

The growing heterogeneity of the American school population had precisely the same effect, but it operated from the opposite direction of attack. With many children of foreign birth or descent entering the schools, it was less easy to count upon a common vocabulary of spoken English among school children. Even the American born population, stratified by the growth of cities and the economic and social differentiation of the people, came to school with fewer common experiences and words. As geographic locations, economic and social situations, and nationality affiliations became more varied, the oral vocabularies of young children, largely the outcome of their social environments, became exceedingly varied. Thus less reliance than before could be placed on methods of formal instruction which assumed a common experience and speech.

The total effect of both causes was to reveal the need to supply an increased basis in content and speech within the spelling period. The spellers themselves show the change. Classification of words by meanings, the appearance of definitions and sentences, are the responses which early authors made.

The More Recent Attempts to Give Meaning to Words

But the modern writer of texts has carried the response much further, and the progressive teacher has gone far beyond the existing texts in the attempt to develop the meanings of words.

In one sense the first method by which school children got the meaning of new words was the contextual method. This was when spelling was a part of reading, and children got the import of words by themselves without any conscious instruction by the teacher. Getting the meaning through context at this period was scarcely a method in the sense in which we here use the term, that is, as professional technique consciously devised as means to an end. Probably the first important conscious attempts of the spellers to develop meaning were con-

nected with the use of definitions. The method of course was synonymic,—a word, phrase, or sentence equivalent being used. Of course, in practice the discriminating teacher supplemented the definition (given orally by the teacher or presented in the book) by giving examples of its use, wherein the word's setting made the meaning clear. The texts attempted to supplement the definitions by adding sentences containing the words. In the latest works the sentences are themselves placed in paragraph setting. At first these sentences were as mechanical and as unnatural as the first sentences in reading primers. They were artless inclusions of the words given in the spelling lists. This is particularly true whenever the word texts are classified upon a phonetic basis. Then the sentences are made accessory after the fact of selection. But in the spellers which classify mainly by thought association, the sentences and paragraphs are accessory before the compilation of the columns of words, and hence are more likely to have an appealing content and a natural construction. This contextual material, following the trend of later reading books, is more and more selected from interesting literary material. The prose selection and the memory gem from poetry are now of frequent occurrence in spellers. Some spellers are as rich in content as the best language books, and, in relation to the amount of formal work to be carried on, provide a relatively broader basis.

Most of the spellers which add content to the word lists give it a wrong placing. Since its function is to lay a foundation that insures the meaning of the word, it ought to be presented before the columns of words rather than after; yet the characteristic practice even among the better books is to have the word followed by a sentence including it, or by the paragraph or the verse from which the word has been taken. Very few books present the sentence or paragraph first and the word or lists of words later, yet the order in the book very generally determines the way the child attacks his spelling. It is a common fact that text-book writers seem to adopt a new device, such as the contextual method, because it is the pedagogical fashion, rather than because it is necessary. In many cases they show no real discernment of its function, its values, and its limitations. They recruit new methods from progressive teachers without

that critical analysis which leads to a discriminating use, and it frequently occurs that they lose some of the conspicuous advantages of the devices borrowed. Writers of spelling texts seem to be the most conservative members of a conservative pedagogical class.

The average teacher is really far more open to intelligent suggestion than the ordinary text-book maker, and many progressive classroom instructors who refuse to use the speller slavishly are doing much to increase its effectiveness. But the text-book's conservatism frequently gets in the way of normal influences making for progress within the school itself. A case in point may be cited. With the youngest children, before any spelling work is used, the teachers present the meaning of words through direct sense experience by utilizing the children's activities as a basis; thus games, "action work," objects, and pictures are some of the concrete bases used in the first spelling lessons. Such methods too often cease suddenly with the appearance of the speller in the second and third grades. The text-book in spelling offers no substitute in the form of pictures. It is somewhat curious that the illustration, which is the text-book writer's substitute for objective work in all the other school subjects, should be used so slightly in spellers, at least through the first few grades. This neglect of pictures is peculiar to the speller. Pictures could be used with effectiveness here exactly as they are in readers and language books.

CHAPTER VIII

TEACHING THE PRONUNCIATION OF WORDS

How the Problem of Pronunciation Enters

So long as the words taught in spelling are those the children use, there is no problem of pronunciation except to correct such mispronunciations as have stolen into their vocabularies. Somewhere in the normal course of their daily lives, in school and out, the children have gotten the experience along with the oral symbol which stands for it. The problem of teaching pronunciation in the spelling period arises out of the fact that many words are first presented to the child in the written or printed form. He is called upon to learn the technique of their spelling without knowledge of their sound or their connotation. Hence the need to teach the pronunciation of unknown words is a demand arising from an abnormal situation, one which is not altogether avoidable in the school.

The Artificial Intimacy between Pronunciation and Spelling

The traditional way of handling such a situation was to get the pronunciation as a by-product of learning to spell the word. Thus instead of getting an experience and its spoken word together, in the manner normal to children and men, the school coupled spelling and pronunciation, and neglected to pay due attention to the third element, the basic experience which gave it meaning. This is well demonstrated by the contemporaneous spellers of the more traditional sort. These lay their greatest emphasis upon the machinery for translating sounds into spellings, and spellings into sounds; sounds are changed into spellings when the words are already in the speech of the child; spellings are translated into sounds when the words are ones the child sees for the first time in print. The prominent place of diacritical marks, the classification of words by common

sound, and the division of words into syllables or phonograms is indicative of the fact that the basis for learning words was shifted from a natural alliance of pronunciation and experience, to an artificial alliance of pronunciation and spelling, which might or might not be preliminary to learning the meaning. At any rate meanings were subordinated in the teaching process. If given at all, they were presented in some incidental and inadequate way. The whole situation is a reversal of a normal situation, a clear case of putting the cart before the horse.

Restoring the Natural Relation between Pronunciation and Meaning

The practical teacher with psychological insight accepts the inevitable fact that children are bound to meet new words for the first time in the written or printed form. He has no serious quarrel with the proposition that spelling words cannot always be taken from the child's developing experience and speech, as these grow in the other class exercises and out of school. But he does not allow this accident of school administration to determine the starting point and the mode of his teaching. He foresees the fact, and leads the child up to the spelling by exercises which give an experimental and an oral basis, which is merely to say that when basic experiences or oral uses have not been provided for the child in the normal course of events, the teacher provides them in the spelling period. This explains why the spelling period in the best of the modern classrooms is no longer pre-eminently a formal and meaningless translation of sight symbols into sound symbols, and *vice versa;* but a natural and interesting exercise in which plays, dramatizations, objects, pictures, and conversations are characteristic instruments in approaching the spelling of words. The teacher has simply made his teaching natural to life in spite of the fact that he is confronted with an artificial situation. The whole consequence of such change in the spirit of spelling instruction is not at once obvious. But close analysis of recent tendencies indicates the result in detail.

Three Modes of Getting Pronunciation

There are three general modes through which the child may get the pronunciation of such words as enter his life through the spelling period. (1) He may, through the imitation of a sound model, attain the speech of his teacher, or his fellow students. (2) He may obtain it through direct phonetic translation of the letters in the word, that is, by means of such conventional and artificial devices as diacritics, syllabification, and phonograms or through the analogies in form between the words he can pronounce and the new word which he cannot. (3) He may utilize all the methods just mentioned, with certain additional techniques, in getting the pronunciation from the dictionary.

The Emphasis of Progressive Practice

Whereas the teacher of a few decades ago, so far as conscious efforts were concerned, used the second method almost exclusively, the more progressive teacher of to-day lays the main stress on the first method. The younger the children are the greater is the stress on oral imitation. The amount of phonetic translation is very generally decreased, and the burden of it, when it is used at all, comes on the oldest, not the youngest pupils. So far as giving children immediate power over the pronunciation of words during the class exercise, the method of example and imitation practically supplants that of artificial phonetic translation. In so far as the latter method enters the class exercise conspicuously, it does so as preparation for or part of teaching the children to consult the dictionary, an activity which aims not at immediate acquisition, but at giving the child the ability to handle new sounds outside the classroom, particularly in afterlife.

Some Specific Reforms

A still further effect is registered in the way in which certain modes of phonetic translation are favored and others subordinated. If diacritical marks are used, the children themselves mark them less and read them more. The movement is distinctly away from the use of diacritical marks in spelling. Syllabification, as compared with phonetic letter spelling, grows

into a relatively larger use. The phonogrammic division of words (f-ield, sh-ield; man-liness, love-liness) which forces the recognition of larger and more normal sound units, crowds out both diacritical mark and syllable. Words are less often separated into their sound units on the printed page; the division is left to the child's own natural attack, which comes through analogy with words he knows or is suggested by a list of words that repeat the same phonogram, syllable, or letter. Irregular words are less often divided; they are treated as sound and spelling wholes.

The Case of the Phonogram

The growth in pedagogical popularity of the phonogram is symptomatic of a general movement away from artificiality toward approximate naturalness. The phonogram is a device which is reforming the method of sight-sound translation, the most formal and traditional of the three modes of teaching children pronunciation. A detailed analysis of the claims made for the superiority of the phonogram as a mechanical unit in phonetic translation explains its sudden and large growth in educational practice. At the pain of repetition these claims are summarized.

Advantages of the Phonogram

The advantages claimed for the phonogram are many. In the first place it provides a larger unit for the division and identification of new words than any other method of phonetic translation, thus reducing the amount of artificial manipulation of words. In this respect it is far superior to alphabetic and phonetic letter spellings. It induces even larger divisions than the syllable. To be sure the phonogrammic method may divide words of one syllable (c-an, f-an, r-an), but practically everywhere else it leads to larger sound units (nim-bleness, humbleness; gr-ievousness; misch-ievousness). It is superior to the syllable in another respect, namely, that it separates words on the basis of their sound division regardless of philological derivation or the conventionalized and arbitrary (from the standpoint of sound) divisions of dictionary syllabification. It is a more flexible mode of attack on a word, taking account of individuality and maturity in children. In the case of the word *relationship*,

one child, depending on the known units or words that happen to be suggested in his attempt at analogical interpretation, might divide the word thus—re-la-tion-ship; and another thus—relation-ship. A very young child just beginning might see it as re-la-tion-sh-ip; but a child with a knowledge of more and larger words would see it as relation-ship. Irregular words, too complicated to be broken up, are treated as phonogrammic units or wholes (thorough), and thus the main bugbears of phonetic letter translation are avoided. The phonogram as generally used avoids all artificial markings, such as diacritics and accents, so that the child from the beginning sees the word as it will be read or spelled in normal use. Even the division of words by dashes is being discontinued. Every one of these advantages claimed makes toward a decrease of artificiality.

Whether our critical estimate focuses upon radical changes or upon the modifications of small details, the result is the same. The modern teaching of pronunciation shows a growing naturalism in its methods.

CHAPTER IX

TEACHING THE ORDER OF LETTERS

The Central Problem in Spelling

To get the child to write the letters of the word in their proper conventional order,—that is the central problem in the school subject of spelling. As discipline, it was present in school long before the more or less independent school subject of spelling appeared. It was there as an activity subordinate to other studies. As one cannot write compositions without knowing how to spell, spelling was a technique acquired along with writing or written expression. It is the earliest of the historic positions of the spelling discipline. Later, when an alphabetic method became the main method for teaching reading to beginners, learning the customary order of letters in the composition of a word became an incidental increment in the mastery of the mechanics of reading. Later still, spelling divorced itself from reading and came to be a subject by itself and like grammar, which had divorced itself from written composition, it came to have formal ends and methods of its own.

Its Isolation Made Spelling Formal

It was the transfer of this central problem in the wholesome teaching of spelling from a subordinate to an independent exercise, which led to a narrow and isolated method of handling spelling difficulties. The attempt was made to teach the order of letters without regard to the meanings and situations with which such a problem was always associated in normal usage. This narrow, isolated way of handling the difficulty made it a dull and formal study, which had to be supported by the powerful but extraneous motives of emulation, which in turn were reinforced by monotonous drills.

Reform Has Succeeded Mainly through Attacking this Isolation

For a century the educational reformers have pitted themselves against the traditions fixed in that long period when teachers tried to teach children to spell by reciting the letters in order—and nothing more! The major successes of the reformers have been distinctly the product of some correction of the false view that children could be taught to spell words just by letter spelling. Spelling methods have been fundamentally reformed just to the extent that teachers have restored mere spelling to its normal setting and function, and brought into the spelling exercise the other factors to which the written order of letters is functionally related. Once mere spelling was the isolated recital of the letters of a word in their given order; the reformer has almost made it an interesting exercise in composition where the formal difficulties of letter-orders are given careful attention.

The Special Technique of Mastering the Order of Letters

We have already indicated how all the elements of good spelling.— meaning, pronunciation, and written order of letters — are being associated in wholesome functional ways. We have indicated, too, how meanings and pronunciations as separate elements are developed within the spelling lesson. It remains for us to suggest the special methods employed in mastering the third and ultimate element in the complete association, namely, the mastery of the written order of letters.

Oral Spelling

Perhaps the main method employed to master the order of written symbols has been that of "oral-spelling." By the method of oral spelling the child always had to have a mastery of the alphabet-names and symbols as a basis. The child in need of a word for his written expression might attempt to translate his own pronunciation into letters, but if, when baffled or too puzzled, he called upon the teacher, the likelihood was that he would be given the order of letters orally without any presentation of the written or printed form. If told to prepare a formal

lesson in spelling, the child conducted his attack through oral spelling, i. e., he looked at the book, blackboard, or other copy, recognized the letters and called their names off in order, drilling on the same.

The Emphasis on Sound Elements

Little emphasis was placed on careful visualization and copying. The emphasis was upon an oral method of mastery and upon a perfection of oral rendition. The spelling match, which was the institution that set the standard for spelling ability through many decades, suggests the elements demanded and the normal manner of meeting the test. The final skill toward which spelling study inevitably tended was oral letter-spelling. The word was pronounced. On the basis of that pronunciation, the word was repronounced, letter-spelled, and pronounced again. The entire emphasis was on the oral rather than on the visual side —on sound form and oral letter-spelling rather than on visualizing and writing the words correctly.

Phonetic Translation Arises from Oral Spelling

The close association of oral letter-spelling with pronunciation was influential in introducing and maintaining another typical method, that of spelling through phonetic translation of pronunciation into the appropriate letters. This is a perfectly rational method by which children try to carry the words of their speech into their writing, or even into the more artificial form of oral letter-spelling. But even where the words are outside the speech vocabulary of the child, which was increasingly the case as he went up the grades, the spelling match and other oral spelling devices made pronunciation the starting point for spellings. It might be that the teacher dictated the words, pronouncing and spelling, or that the child read the words in the texts prior to studying their spelling, but somehow, because of necessity imposed by the final test of oral rendering, the child learned to name the letter order in connection with pronunciation. This connection led to the development of phonetic translation as a mode of teaching and learning.

The Method of Phonetic Translation

All phonetic methods, whether they be alphabetic, symbolic, or phonogrammic, rely upon giving the child ability to convert the elements of sound into letters or groups of letters which symbolize them. They have this in common,—that they depend upon sound translation. They are different from each other because they use differing units of sound and visualization for their procedures. In varying degree they have a common strength and weakness. The limitations of such sound translation are obvious to anyone who will pause long enough to take a critical view of the situation.

Its Defective Assumption of Pronunciation

(1) In the first place the method assumes that the child has a perfect command over the pronunciation of words, for that is to be his basis for translation. If he translates a mispronunciation, the spelling is bound to be wrong. The teacher can assume considerable efficiency in sound translation only where the spelling words taught are taken from the oral vocabularies of children who pronounce correctly, i. e., in the lowest grades of a school the children of which are drawn from a cultured English-speaking population. If 'catch' is pronounced 'ketch,' and 'going' is called 'goin',' it is probable that mere sound translation will lead to defective spelling. And as soon as the higher grades are reached and the words selected from the spelling exercises are taken less from the small spoken vocabulary and more from the larger written vocabularies, there is no guarantee that sound will be a guidance. The child may desire to use a word the meaning of which he has gotten from his reading, and the pronunciation of which is not certain. With a meaning in his mind that he wishes to write and no pronunciation, the teacher's problem is to give him a definite notion of the form of the word, of the way it looks when written. The apparent need of such a type of work has led to the introduction of the many devices that we class under the phrase, "methods of visualization."

The Probability of Inaccurate Translation

(2) The method of sound translation has an additional defect in that the limited alphabet with which we write the English language has not as many distinct symbols as there are sounds. Having the pronunciation, the child must separate the word into sound elements (not a simple and easy matter always), and then find the appropriate symbol for each element. A sound may sometimes be expressed by one letter, sometimes by another, sometimes by two or three letters. A given vowel, for instance, may have a number of values, some of which approximate one of the numerous values of another vowel. All these possibilities decrease the efficiency of any method which aims to give the child the order of letters from the order of sounds. This second difficulty re-inforces the need of depending on visualization and the muscular memory which comes through writing words.

The Breakdown of Translation in Irregular Spellings

(3) But the first breakdown of phonetic translation occurs when the child is confronted by the irregular spellings of the English language. Here phonetic translation gives the child a totally wrong first impression, which is effaced only with great effort upon the part of the teacher. Silent letters will be left out; groups of letters which stand for a single sound will not be suggested. The teachers may avoid such irregular spellings as long as possible in the spelling period, but they will enter the child's speech and composition. The correlation between difficulty in spelling and difficulty of meaning or pronunciation is slight, and words enter into the child's usage largely through their appropriateness to his experiences, with extreme difficulty of pronunciation as a minor check. In the more vital methods of contemporary teaching, these irregular words are calling for treatment as early as the child wishes to use them, and the old artificial avoidance of spelling irregularities through delay can no longer conceal the weaknesses of phonetic translation as a method.

The Long Concealment of These Defects

When one considers that the methods of phonetic translation have held their dominant position in the schools for more than

a century and that teachers of spelling have given the development of them their major attention, it seems strange that their insuperable defects should not have become apparent sooner. It has already been suggested that the functional ideals of modern school life, the closer relating of one subject to another, and the recent increased heterogeneity of our school population, largely account for our dissatisfaction with spelling methods. The absence of these factors during previous decades made concealment of inefficiency easy. But there are additional reasons why the method of phonetic translation did not reveal its faults. They were partially corrected by other methods which teachers of common sense hit upon by trial and error, without much knowledge of the psychological conditions and principles involved.

Copying

One of these methods was that of copying the spelling of words and rewriting them many times. In its earlier uses such written drills were regarded as a means to oral spelling. Written spelling and oral spelling occupied an opposite relation to that which they naturally hold in life and in the more practical and naturalistic teaching of the modern progressive school. To-day, oral spelling is merely one of many means of approach to accurate written spelling. Simply because the true relation of an oral method to final skill in writing words correctly in composition was not perceived, this first use of copying was more or less futile and wasteful. The children wrote their words twenty, thirty, or more times mechanically, taking off the spelling from the model last written. There was little noting of visual peculiarities, little associating of form with other elements in the total spelling situation, such as meaning, pronunciation, muscular memory for letter combinations, etc.

Written Spelling Succeeds Oral Spelling

The focusing of attention on written spelling came comparatively late. As a reaction it expressed itself in an isolated and extreme way just as oral spelling had before it. Children learned by writing each assigned word ten times. The teacher dictated the words and the children wrote them in the spelling blank.

The teacher or student told off the correct spelling orally and the children marked the errors, writing ten, fifteen, twenty or more times, in corrected form, the words missed. Such a substitute was not wholly a reaction against an older method; it was partially the product of the pressure for time. It is no accident that this change from spelling matches and other oral spelling recitations comes at the precise period when the elementary curriculum is enriched and the time schedule greatly crowded. All the children can be tested on all the words at once in a written spelling lesson; the spelling match and similar activities had their halcyon days when there was less strain upon a teacher's time.

Developmental Lessons in Spelling

But spelling was not really taught by such means; it was tested and corrected. The careful presentation of the developmental lesson, as applied to spelling instruction, was scarcely known in the day of the spelling match and the "twenty-five-word-a-day" spelling blank. It is the very latest stage in our progress. We have already noted in another chapter how the developmental lesson appeared in modern teaching, carefully presenting each element that the child needed to know in such a way that the chance of error would be minimized. Here we are concerned only with the special provision made for a careful presentation of the order of letters that constitute the written form of a word.

Eye and Ear Tests

Special classification of words in order to segregate their difficulties is one device of modern teaching which illustrates our discriminating methods. Regular words that are capable of direct phonetic translation, that is, spelled by sound, are put together in "ear lists" (dash, foot); words with silent letters or vowels expressed by a combination of symbols, where spelling and pronunciation nearly correspond, are brought into "ear-eye lists" (toad, listen); and out and out irregular words, ones containing very unusual vowel or consonant symbols, where sound analogies render little assistance, are grouped in eye lists for careful visual study and much written work (through, vein, ocean).

It is in connection with such irregular words as would be classified in the "eye lists" mentioned, that the modern teacher has been most ingenious in inventing teaching devices. The versatility of these can only be suggested.

Methods of Visualization

In dealing with irregularly spelled words much attention has been paid to correct visualization on the part of the pupil. To enforce full attention, "flash card" work has been used to compel the child to visualize quickly and accurately. The teacher exposes for a few seconds a card with the desired spelling, and the child writes it down. Another modification is for the teacher to write the word slowly and distinctly on the blackboard and then erase it when done. This has the advantage that it makes the child perceive the word in the order of actual writing as well as in full final form. Again, irregular portions of troublesome words are underscored or written in color to center attention on the particular part. Long words which confuse by their length, are broken up to reveal familiar words or other units (child-hood, en-feeble-ment). Words are compared with similar combinations (cough, enough, rough). Homonyms are carefully compared and differentiated (their, there). Mnemonics are used to eliminate confusions (as when the dome of the structure is associated with the *o* in capitol to differentiate it from capital). Many repeated visualizations, oral spellings, and writings are given in the case of special irregularities. All these varied methods represent the resource used by the modern teacher to present and fix proper spellings for the child.

Print or Script Models

The whole purpose of such careful efforts at sight visualization is to get the child to see the word in its correct form from the beginning and to safeguard him in advance against any probable misspelling. So careful are some teachers to insure a correct visual impression from the start that they insist that words should be presented and mastered from script rather than from print, as the average child will write, not print, when he spells. Very few texts in spelling have adopted the sugges-

tion. It is expensive and against tradition. It may be, too, that the promised advantages are not sufficiently large to warrant the extra trouble, even though increased efficiency were certain.

On the whole, then, the technique for teaching the order of letters in spelling has undergone revolutionary changes in the last quarter century. The methods of teaching are much more complicated. Written mastery takes precedence over oral spelling. The emphasis has passed from dependence on regularities between pronunciation and spelling to a careful focusing of attention on irregular elements in words. Spelling is now really taught and studied at school rather than merely tested. Careful presentation of difficulties to avoid error, particularly through visualization of spelling forms, occupies most of the recitation time which formerly was given to the hearing of lessons and the correction of errors.

CHAPTER X

DEVELOPING THE PUPIL'S INDEPENDENT POWER

Teaching Children to Study Supplementary to Instruction

The teacher has more functions than teaching a child to know, pronounce and spell a certain group of words with persisting accuracy. In addition to instructing the child, he must show him how to study; in this case, how to get by himself the meaning, sound and spelling of words that are unfamiliar to him. The teacher may successfully transmit all the words needed by the child and required by the course of study, but his task is still incomplete. He must train the child to solve new spelling difficulties as he will meet them in later life outside the school. To do this the beginning must be made at school, while he is still under the supervision of the teacher.

Four Characteristic Types of Activity

There are four conspicuous types of work which the school assumes in the spelling period in order to give the pupil an enlarged power to know and settle his own spelling difficulties without the aid of the teacher. These are: (1) the use of word analysis, (2) the application of spelling rules, (3) the use of the dictionary, and (4) the training of the child to direct himself in the extension and correction of his own vocabulary. Each of these will require consideration in turn.

Word Analysis

Twenty years ago word analysis was a study by itself, closely affiliated, however, with spelling. It often utilized texts in word analysis separate from the usual speller. Frequently, too, it had a time-assignment of its own in the weekly schedule, either completely taking the place of spelling in the highest grammar grades or sharing with spelling the time usually assigned to the latter subject in the previous grades. Thus spelling might have

two periods per week and word analysis three, or vice versa. The work was formal, as formal as the spelling of thirty years ago. Its relation to spelling was in controversy much as the relation of grammar to oral and written composition has been. So that word analysis, or word study, as it is now often called, went up and down in favor with formal grammar and rules for spelling. The same movements in pedagogical thought were behind each of them.

The Reaction against Word Analysis

A reaction against word analysis finally occurred, and it almost disappeared as a subject heading in courses of study. A few conservatives hung on to the title; others interpreted it as a definite part of spelling instruction. Some of the texts in spelling which had excluded the formal word study now included it in the last chapters, as a kind of appended text in word study. It disappeared from many texts except for casual uses of prefixes, suffixes, and stems in occasional exercises scattered through the book.

Its Restoration in Spelling

Of late, however, word analysis has had a restoration. It now appears scattered throughout the intermediate and grammar grades, wearing a less formal and forbidding countenance than it once had for the child. As though to forget its own reputation, it appears under the new names of word study and word building. It has also lost much of its deductive spirit. The child is no longer required to memorize lists of prefixes, suffixes, roots and definitions, making application and use of them at some later hour or day, or not at all. As incorporated in the better spellers, word study is conducted in a distinctly inductive spirit. When the children have added to their vocabularies enough words with a common root, prefix, or suffix, the unit of derivation is brought into consciousness through comparison, its meaning established, its derived forms identified, and its applications extended. With a chastened spirit becoming to it, word analysis has given up its independence and become an accessory to the subject of spelling, performing its several special services with a modesty appropriate to its place.

Word Analysis and Word Building

The desire to avoid an old term doubtless had something to do with the substitution of such phrases as word study and word building for word analysis. Yet in present usage they are not used as equivalents. The reaction which drove out the subject was against an activity as well as a name. Word study as a term is variously used in spellers. Word study seems to be the more inclusive term, expressing the child's study of words both analytically and synthetically. Word analysis emphasizes the analytical aspect which separates words into their units of derivation; and word building refers to the opposite process where children, having the prefixes, suffixes, and stems, are enabled to construct additional derivatives, new to them. Generally the two latter processes are subsumed under the term *word study,* and are supplementary, though for the purposes of spelling instruction they have a different value.

The Worth of Word Study

The value of word study, particularly word analysis, in giving the pupil an enlarged independent power to solve new spelling difficulties, must not be measured in terms merely of its aid to the spelling of a word. It was largely upon this exclusive standard that the reaction against word analysis set in ten or fifteen years ago. It was felt that the assistance was too slight and too indirect; that it was better to master words outright by direct memorization than to come to an approximate but uncertain conclusion through the encumbrance of many explanatory roots and affixes. Our schools were then interested mainly in immediate results. Mere instruction dominated classroom teaching, as the aim to give children independent power by teaching them to study was not yet emphasized. Of course it has to be admitted that word analysis sometimes assists spelling somewhat directly, as when a child, about to spell the word Mediterranean, finds himself in doubt as to whether the t or the r is to be doubled, and gains an immediate answer through word analysis. But the degree to which it assisted was then much in doubt, and it was difficult to believe, on the basis of the functions the spelling period then possessed, that it was large.

Nor would the very small aid that word study renders to pronunciation, which as a function is now more important in the spelling period than before, help the argument for the use of word analysis to any degree. Of course the child must attack a new word in sound units of some sort. As the best units are frequently those which keep true to the history of the word, word analysis does aid the pupil to break up a word into convenient parts whether these be syllables, or phonograms, or combinations of both. But it may be contended with some show of evidence that everything gained from word analysis in independent power to pronounce words, may be gotten equally well by the child's natural tendency to break up new words in terms of words and parts of words already known to him. The use of syllabification and classification upon the basis of similar phonograms, two devices now much used, must have quickened his power to recognize parts of old words in new ones.

But some word analysis sanely handled gains an enlarged worth the moment two facts are admitted: (1) That the responsibility of the spelling period for developing the meanings of words has greatly increased; and (2) that word analysis materially assists the child in getting the approximate meaning of words, so that, with the assistance of the normal context, it proves quite valuable to the child who is compelled to get the sense of the word when he is away from teacher and dictionary. It is not contended that the method of word analysis is an efficient and economical means of teaching a child the meaning of a word; it is not. There are a half dozen better ways. Telling him is one. The value of word analysis lies in the fact that it enlarges the child's power to get the meanings of strange words for himself after he has left school.

Such word study gives a considerable extension to the child's power to get the meaning of words, but it does not take the place of the dictionary. The constructed meaning which comes through word analysis merely approximates or suggests the precise signification of the word. This is fully recognized by teachers and authors of texts, for some of the better treatments not only separate the word into its derivative parts and give the meaning derived from the parts, but they follow it with an accurate definition and illustrative sentences. Accurate dictionary

work with much application of the meaning in speech and writing must be the final supplement of word study.

The Use of Rules

If the main value of word analysis lies in suggesting the meanings of words, the principal worth of teaching rules of spelling to children is to give them independent power to spell words that are used in changing form, exactly the situation where word analysis helps least or actually confuses. In progressive practice the teaching of rules has gone through about the same treatment as word analysis. It was overdone twenty years ago, the reaction against formal deductive ways of teaching tending to eliminate it completely; now there is a tendency towards its restoration to a restricted place with a much changed emphasis and use. Even a casual comparison of old spellers with new ones reveals the conspicuous changes which have occurred in the attitude toward the use of spelling rules.

The Inductive Teaching of Rules

In the first place spelling rules are taught inductively. When the children have mastered enough individual cases to afford a basis for generalization, the rule is induced by the child himself from his own knowledge. The better books do not call for the memorization of many rules, with numerous exceptions, followed by a study of more or less unfamiliar illustrations. Often the teacher is quite content when the child merely senses the rule, and refrains from calling for a verbal formulation of the rule. Some of the better texts still print the rules with illustrations, but specifically state that they are to be *taught inductively*. But the very statement of the rule, preceding the concrete illustrations, must tempt more than one old-fashioned teacher to ignore the injunction and follow the order of the book. One of the best books escapes this weakness by grouping typical words previously taught under such captions as "double the last letter and add *er*," "add *less*." Each typical series has its typical interpretative caption, the rule and its exceptions never being written out.

The Small Number of Rules Used

In the second place the number of rules taught is small. Not more than four or five sets of rules are included. Words which do not fall under these are mentioned as individual words, without regard to any laws which would indicate their conformity to type. Thus the burden on the child's memory is lightened by a reduced quantity of rules and by the vital way in which mastery is induced.

The Use of the Dictionary

Training children to a competent and ready use of the dictionary and fixing the habit of consulting it, is one of the main duties that the school can perform for the student. The dictionary will take the place of teacher and spelling book, once the child has left the school. Without the impulse to use the dictionary or the ability to interpret it, the child is without the capacity for making further advances in a definite and accurate way. The emphasis upon the right use of the dictionary cannot be too great, particularly in the upper elementary grades.

The Specific Demand for Dictionary Work

In general there has never been adequate demand in our courses of study for teaching the child to use the dictionary. It has been assumed that somehow in the course of school events, the child would pick up this ability. That he does not do so has been demonstrated in many cases. Some children as high as the fifth and sixth grades, owing to the fact that the alphabet in its proper order is no longer learned in beginning reading, are incapable of finding words in the dictionary. Such discoveries as these have led to a demand that dictionary work be assigned as a specific responsibility for the teacher. For obvious reasons it has been assigned to the subject of spelling, and is usually begun in about the fourth grade.

The care given in teaching pupils to use the dictionary is a contrast to previous slipshod methods. It might be well to note how thoroughly each step in the process is developed by the modern teacher. First, the alphabet is reviewed to see if it is well within the child's easy habitual command. Then

the child is sent to the dictionary to find simple words the spelling of which he knows. At first these words have different initials to establish the simple principle of alphabetic order. Later, words beginning with the same initials are assigned to show that the initial letter alone does not determine the place of a word in an alphabetical list. Thus, the principles of alphabetical and sub-alphabetical arrangements are mastered. And last, words, the spellings of which are doubtful to the child, are given; and the child is taught to scan the pages till he finds them. Special exercises are given to show a child how the pronunciation (lesser, lessor; least, lest) or meaning will assist him to find the word when the spelling is in doubt (capitol, capital; limpit, limpid). Special exercises are given to show the child how to determine which is the preferred spelling when there are two.

Exercises in finding pronunciation are given in the same careful way until each technique is taught,—preferred pronunciations, the interpretation of diacritical marks through the key words at the bottom of the page, the meaning of the accents, etc. Then the child is drilled until he can readily determine the meaning of a word. The abbreviations for the parts of speech are explained. He is encouraged to read all the meanings, avoiding those marked "rare," "colloquial," or "obsolete," and finally selecting the most likely meaning with the aid of the examples of usage. No child can be carried through such training without forever after carrying with him the power to get at the meaning, pronunciation, and spelling of words for himself.

Methods of Self-Cultivation

But it does not suffice that a child shall be told the right way to pronounce or spell a word, or that he be shown how to find it for himself. Self-growth is dependent upon the development of the child's sensitiveness to clashes in usages, whether they be in speech or in print. Let a child be skeptical of his own usage every time he sees or hears a conflicting one, and the basis for self-cultivation is laid. Then give him the persistent habit of appealing to a dictionary and he will learn the right form. Last, train him to repeat the spelling, pronunciation, or usage often and associating them in every possible

way,—and he will steadily increase his spontaneous command over words and their functions.

There is far too little teaching of the child to correct, and drill himself in our schools. It needs to be done. Isolated teachers have already made a start that ought to be imitated by all good teachers.

CHAPTER XI

TESTING SPELLING

Testing as an Exclusive Activity

Several decades ago the spelling period was almost completely given over to testing the efficiency of the children's spellings. The teacher assigned a lesson and the children prepared it at home or in a study period at school. The testing of spelling and the noting of spelling errors was thus the major activity of the children when under the direct supervision of the teacher. Beyond assignment, testing, and correcting, little was done. Teaching spelling in the sense of giving a careful presentation of words so as to guarantee correct first impressions of words was scarcely given any emphasis, if, indeed, it was given any place at all.

The Subordination of Testing

Since then there has been, in the best schools, a complete reversal of emphasis; testing as a function of the classroom exercise has been subordinated. Instead of usurping a major portion of the time, it has become a step or stage in the spelling lesson and no more. The smaller number of words taught per day has made this possible. The increased emphasis on a careful development of new spelling words, and the tendency towards a more careful correction of spelling mistakes have together squeezed the new function of examination into a smaller time allotment. Traditionally the testing of spelling has taken one of two general forms: (1) oral spelling and (2) written spelling. Each of these has had a considerable number of variations.

Early Emphasis on Oral Spelling

The early connection of spelling with oral reading gave emphasis to oral spelling as a form of examination. This is attested by the great popularity of the spelling match during

the period when spelling first gained an independent place as a subject. In fact, for a long time, teachers seem not to be conscious that the final way in which a child spells in normal life is through the written form. The test of perfect learning generally utilized was the ability to give the names of the letters orally in their proper order.

Its Artificiality

Such oral rendition was naturally artificial because the activity of spelling was not seen in its normal function or setting. It stood out of relation to its practical uses or to the other school subjects. Naturally in the wake of a system which emphasized oral rather than visual forms, oral renditions rather than the writing process, other symptoms of the subject's disconnection appeared. Words were not studied in context, but in isolation. Hence, if the words included within a given day's assignment had any organized relation to each other, it was not that of presence in a sentence or paragraph expressing a unit of the child's thoughts, but rather that of a list of words casually related by some unifying principle largely present in the teacher's mind, e.g.—a common element of sound construction or a common membership under some general name (tools, colors, etc.). More frequently the spelling lesson was a list of unrelated words without any pretence of relationship. They were more or less haphazard collections of words that the child needed and was deemed able to spell at about this point in his school career. At first the children probably recited their spelling, as they did any other subject, on the call of the teacher, either at random or in some regular order.

The Appearance of the Spelling Match

Of course children driven to meet such a test, without motive inherent in the activity itself, got their stimulation in terms of adventitious school honors or of escape from school humiliation. Pride or fear of a standing in the class marks, competition and rivalry with their fellows, were the sources of motivation. And the teacher in the effort to get better results enlarged the devices that would support these psychological means. The great device

evolved was the spelling match, with its intense competition. It became the dramatic event of class life. When it was extended to include class and school competitions the enlarged pressures of group rivalry were placed behind the pupil's work. The community became interested, and the spelling match of the elementary school stirred an interest comparable to the intercollegiate foot-ball struggles of the present day. Even the adult members of the community indulged themselves in the fascinating test of superiority and it became a kind of intellectual town sport.

Its Shortcomings

The tracing of the forces which made the spelling match test important has already suggested its limitations. It still further beclouded the truth that written contextual spelling is the only real and final test. It emphasized peculiar and difficult words, little used in common life. It focused attention upon the rare speller, as keen competition of this sort usually does, and neglected the modest needs of the less able child. In time all of these defects were perceived, but the process was a slow one.

Reaction against the Spelling Match

Many factors contributed to the reaction against the spelling match system. Under the influence of other educational movements, attention was necessarily distracted from the subject of spelling itself. A crowded curriculum did not permit of the former extravagant devotion of energies to spelling, and the doctrine of individual teaching dragged the laggard and the weakling into the teacher's consciousness.

Written Tests Supersede Oral Recitations

A return to the older type of oral recitation was not possible. It went down with the spelling match that superseded it. It was too slow. All the children could not be tested in the short time allotted. Some more economical method was required. It was found in the written spelling lessons, where all the children wrote their tests from the teacher's dictation.

Testing by Dictation of Sentences

At the start these written dictation lessons were hardly less formal and artificial than the previous oral tests. Spelling was still a test spelling of isolated words without context or much stress upon meanings. But a better psychology of teaching was subordinating the formal subjects to the experiential activities of school life. As words were selected more from the children's uses and needs, it was possible to test the child's ability to spell in sentences. Sentence dictation superseded, in part at least, the older list dictation, or paralleled it as an occasional or even constant exercise of the spelling period. This tendency has grown recently. And so clearheaded have some teachers become that they do not regard efficiency in spelling from sentence dictation as any more than a very good approximate test, for they look to correct spelling in spontaneous written expression as the only real and final standard.

The Place of Oral Work

It must not be implied, however, that there is no place for oral spelling or for the spelling match as a mode of testing. The best current practice does not eliminate these, but uses them in their appropriate place without abuse. With young children it is often necessary to be certain that the right first impression has been gotten, and a teacher may quickly test up her developmental work by rapid random requests for oral spelling. A child's trouble may frequently be revealed to the teacher and the class by an oral rendition, where the slower method of written exercise might conceal it. A similar sort of reservation needs to be made with regard to the spelling match. It has very conspicuous limitations as a daily or even as a weekly exercise, but it has decided advantages as an occasional method of review. It affords a stimulating and interesting change of activity from written reviews. It can be used as a sharp check against guessing at the spelling words if properly conducted.

The tendency in the evolution of methods of testing children's spelling abilities is marked. It moves steadily toward methods (1) which foster the use of better motives in learning to spell, and (2) which measure efficiency in situations which are nearest like those of normal use.

CHAPTER XII

THE CORRECTION OF MISSPELLINGS

The Weakness of Previous Corrective Teaching

The purpose of all testing is to discover the spelling mistakes of children. But discovery of error necessitates the correction of the fault. The older practice of teachers was strong in discovery and weak in correction. The correction usually consisted in sending the child back to the correct form, leaving to him the discovery of the technique by which he could overcome his difficulty. Usually the child found no other technique than the mere repetition of oral spelling or the copying of the visual form a given number of times. The child exercised no ingenuity because he was incapable of diagnosing his own case; and the teacher suggested none for he was scarcely aware that there was more to do than to drill upon the word.

The Difference Between Original Learning and Correction

But learning an old word correctly, after incorrect habits have been formed, is vastly different from learning a new word about which the child has no misconception. To send the child back to the old form to "learn it anew" is not the simple matter that is implied. Every teacher in his more thoughtful moments knows that the path from ignorance to knowledge is less complicated and easy than that from error to knowledge. In one case a habitless child forms a habit; in the other, the pupil must break one habit and form a new one through conscious effort.

Failure to Apply the Distinction

The attitude of recent theorists on spelling method and contemporaneous writers of text-books, shows that the distinction is by no means applied or apparent. This is clearly brought out in the discussions on the teaching of homonyms. One set of

authors says that all words containing similar elements should be completely disassociated, that is, studied one at a time in complete separation from each other. Another group of writers states just as emphatically that words with similar elements that lead to confusion must be brought into consciousness together, compared and differentiated. Such experiments in comparative teaching as have been conducted give evidence that the first group has generalized from the teaching of new words to young pupils and that the second group has derived its principle from the correction of errors among older students. Each has made a generalization from one situation and falsely applied its truth at large. They have not made the distinction between proceeding (1) from ignorance to knowledge and (2) from error to knowledge.

Normal Stages in Our Progress

Only slowly has this distinction between the presentation of new spellings and the correction of misspellings been brought to the consciousness of teachers. One might say, of the profession at large, that it has not yet been recognized. It is not surprising that distinctive methods for the correction of spelling errors are just beginning to be evolved. They could scarcely have appeared sooner, since the teaching of spelling as distinguished from the recitation of spelling is a very recent procedure. In the evolution of our spelling methods, the periods in our progress are thus characterized: (1) In the early period we merely test spelling; (2) later we teach spelling and test the success of the teaching; and, (3) now we teach, test, and correct the stubborn errors which persist.

The Psychology of Presentation Applied to Correction

The awakening of the teacher to the idea that spelling needs careful primary presentation, just as any other subject does, was the basic step in suggesting that he must also have a special method for correcting misspellings. Much of the psychology that underlies good instruction in new words is coming to be applied to the correction of mistakes. The mere fact that developmental teaching and good lesson assignments came into existence out

of the teacher's desire to prevent wrong impressions and false habits, focused the teacher's consciousness upon the causes of spelling errors. It was only an additional step upon the part of the thoughtful teacher to begin to treat misspelling by special methods devised for that purpose.

The Gross Defects of Old Corrective Methods

Let us look for a moment at the characteristic methods traditionally employed for the correction of errors. If the child misspelled a word, the correct form was set for him by the teacher on paper or blackboard. The child, looking at the form, copied it below,—ten, twenty, or fifty times, as might be required. It was purely a mechanical exercise. Each time he wrote, he scarcely thought of its meaning; he did not necessarily think of its sound. In all probability he did not translate its sounds into letters, he merely imitated the form he saw. It was more nearly an exercise in penmanship than in spelling. That it was mechanical and thoughtless is suggested by a very common experience. Every teacher has noted that a child mechanically copying words might misread the form, mistaking an " e " for an " i," or an "o" for an " a," thus misspelling the word. The careless misspelling was then copied in the successive repetitions. It was a kind of correction which did not correct. The teacher did not guarantee a motive for the child's effort or a means for guaranteeing a full association of all the elements involved in good spelling,—meaning, pronunciation, and written form. The child's whole attention was on copying, mastering a written form out of the normal setting of its use. The result was that, in many cases, the very child who had written a word fifty times would misspell it in the composition class. There the chain of connections starts with a meaning, revives the pronunciation, and leads him straight to the old association with a wrong form because *the misspelling was acquired in normal setting.* If he had thought of his error every time he wrote the new form, the corrective work might still have been successful, for when he started to write the old and incorrect association the new form associated with it by the corrective repetition might have inhibited and diverted him to the new spelling. But the column copying did not even guarantee that inhibition. The true correction might

better be made through substituting a new chain of associations, than through adding an inhibitive associate. The teacher should establish a new neural path beginning with meaning and leading through pronunciation to correct written form, and exercise it so well that it would become the path of least resistance, leaving the whole incorrect form to fade out through disuse.

Individual Treatment the Essence of Good Corrective Work

The essence of good corrective work lies (1) in individual teaching and (2) in sufficient time for the formation of new habits. As long as the mass teaching of classes was our exclusive practice, any real correction of errors was impossible. One can teach new words to a whole class by group instruction, because all the children require them; but misspellings are likely to be far more individualistic in their distribution. Even when children misspell the same words, the misspellings will be different. And when the misspellings are alike, the causes will vary. The error in one case will be due to the fact that the child did not see the form correctly; in another, to faulty pronunciation; and in a third, to mere carelessness in writing. The first requirement is good individual diagnosis. The second is suggestion by teacher to child of concrete exercises designed to correct the error. These must be sufficiently simple for the child to be able and likely to carry them on by himself. And then there must be some track kept of these individual tasks, so that the teacher may re-test for the purpose of knowing if the correction has been made. The individual spelling lists, previously discussed, which are made up of words which the child either does not know and is told, or which he has actually misspelled, should be utilized to check up the efficiency of such individual corrections.

The Need of Time and Exercise for Habit-Formation

But it takes time to substitute new habits for old, and the average teacher is far too impatient of error to see that its causes are deep seated. It is easier to attribute error to childish perversity and to administer moral blame than to seek its psychological causes and treat them with persistent and thoughtful attention. How often does the teacher correct the child's error

at one moment and expect him to know the word the next! If the pupil slips up on the word the next moment the instructor is more likely to blame than help, as though the pupil were morally culpable. His error is treated as a matter of sin, not as one of gradual habit formation. The child should be interested in the need to correct. He should be given considerable exercise in the normal use of the right form, so that the new habit may grow into a lusty competitor of the old. The teacher cannot get the result at once. In the early stages of correction it may be that the child will spell the word correctly in the spelling period and lapse in his composition where the mind is centered upon ideas and form is merely in the margin of attention. This is not a discouraging fact; it is rather a characteristic symptom of the first stages in reform. Later in the spontaneous written exposition of his thought he may be inconsistent in his spelling, —sometimes spelling the word as it should be and sometimes not. This should be a source of hope, not of despair, for it marks a middle stage of growth. It is only in the last stage that the new habit becomes completely ascendent and that the word is spelled with consistent correctness. The teacher should remember that there are stages of growth in correcting spelling errors as there are in everything else. A single reprimand or caution by the teacher does not correct a mistake, it merely presents the problem. Time, care, and exercise are required to solve it.

Up to twenty years ago the characteristic activities of the spelling period were a mere examination of the child's ability to spell and a drilling upon the correct form of misspelled words. Within the last decade the prevention of error, rather than testing and the noting of errors, has become the major activity. Apparently we are now about to devote an increased energy and ingenuity to the weakest spot in the spelling lesson,—the correction of misspellings. We are ready to develop a technique which will adequately correct those misspellings which escape all the anticipatory efforts of our best teachers. It is in the diagnosis of spelling errors and in the skillful substitution of new and correct habits that we shall find our largest immediate opportunity for improving our methods of teaching spelling.

CHAPTER XIII

THE QUANTITY OF FORMAL INSTRUCTION

Fewer Words Assigned per Lesson

The change from the testing to the teaching of spelling in the class period has had a more or less immediate effect on the quantity of words assigned to the child for mastery within a given day, week, or year. The simple and formal hearing of spelling words permits an assignment of from fifteen to twenty-five words for each lesson; the elaborate treatment of a developmental method of teaching makes it impossible even to seem to cover so much ground, and the number of words assigned for each day's mastery gradually decreases. The extent of this change is indicated in the radical proposal of some of the best teachers and text-book writers that only three or four new words per lesson should be assigned in the primary grades and only five or six in the grammar grades.

The Smaller Vocabulary Demanded

The pressure of new and elaborate methods of teaching has reduced the assignments materially, though considerable variation is still characteristic. The reduction has found sanction in scientific analysis and investigation. Some investigators claim a child cannot master as many words as the old system demanded of him, that cramming with temporary efficiency concealed much unthoroughness in learning and that spelling errors were never adequately corrected. Quite regardless of the inefficiency of large assignments, others urge that large assignments are unnecessary. These quote authority, Max Muller among them, to show that the vocabulary of well-educated persons does not extend beyond three or four thousand words, while the ordinary spellers contain six thousand words. From this point of view

three thousand new words distributed over eight school years of from eight to ten months each make a thorough mastery of very small daily assignments of words completely adequate. Thus, on grounds both of psychological efficiency and of social demand, the amount of work required in spelling has been decreased.

Reduction in Time Allotment

The movement for small assignments in spelling has had the secondary effect of reducing the time allotted to the formal study of the subject. Within recent decades there has always been great variation in the time allotted to the subject of spelling. The larger city school systems show a variation anywhere from three or four to eight or ten per cent of total recitation time assigned to spelling. But wholly regardless of variation the allotment has been materially cut down in practically all school systems from one-quarter to one-half, depending upon the particular city.

Less Frequent Periods

The decreased time allotment has had an inevitable effect upon the spelling period. But the resulting adjustments have been made in two distinct ways. (1) The cut in time has been evenly distributed over the five daily recitations; or (2) in order not to make a teaching unit too short, three or four rather than five periods have been used. But the practice does not consistently follow one or the other plan, for there is considerable variation throughout the grades, a different policy being followed in primary, intermediate, and grammar grades.

Distribution Through the Grades

For example, there is a marked tendency toward five periods a week with the youngest children, three with the intermediate pupils, and two or even one, with grammar grade children. Occasionally, when the work in the grammar grades becomes testing rather than teaching, as the older pupils are supposed to be able to study words and correct errors by themselves, five very short periods are utilized for formal work.

The Elimination of Formal Study

The tendency to vary the distribution of spelling periods also expresses itself in a movement toward the complete elimination of the special spelling period. There are four distinct symptoms of this tendency: (1) The subject of spelling is given no special time assignment during the first half or the whole of the first year. (2) The spelling period disappears from the higher grammar grades and is taught incidentally, that is, in connection with the other school subjects. (3) The time assignment for spelling is included under that of language and the subject is thus subordinated. (4) The theoretic proposal is made that a superior incidental teaching of spelling throughout the grades is just as effective as formal instruction in special class periods.

Formal Work in the First Grade

The beginning of the formal teaching of spelling is now quite usually delayed till the second half of the first school year or till the beginning of the second grade. There have been arguments and influences behind this tendency other than those already mentioned. The primacy of reading in the first grades has somewhat delayed the introduction of such formal subjects as arithmetic, penmanship, and spelling. The delay of written composition and penmanship postpone the need to know how to spell. Under modern methods of teaching children to read, spelling is unnecessary for the beginning reader; it is, like penmanship, one of the subordinate techniques necessary to written composition, and appears in the curriculum the moment the emphasis is shifted from oral to written expression.

Formal Study in the Higher Grammar Grades

In the higher grammar grades the tendency towards the reduction or elimination of formal study in spelling rests upon different grounds. The increased dependence upon incidental acquisitions of spelling, particularly of vocabularies peculiar to other subjects such as geography, arithmetic, history and science, has reduced the need for exclusive and extensive treatments in the spelling period, and curtailed the necessity for continuing the formal study of spelling in the highest grammar grades. Again, by

the time the pupils have reached the higher grades the expediency of the teacher's developing new words and corrections is questionable. The child who has been carefully taught in the lower grades is supposed to have acquired a spelling vocabulary for intimate daily use, and such new words as he needs to pursue he should learn for himself. It is the time in the pupil's school career when he ought to show power of independent study and self-correction, when he ought to become self-reliant. So here the teacher merely takes a short time for the formal testing of spelling lessons or else takes care of new words and misspellings as they occur incidentally in the process of instruction in the other subjects.

Complete Elimination of the Spelling Period

The tendency to lump the spelling assignment with that of language in general, is indicative of a movement, which at one time attained a wide theoretic acceptance, but the application of which in practice is restricted. This was the movement toward abolishing the spelling period entirely and depending upon the incidental teaching of spelling words. Two current tendencies gave sanction to this step: (1) the increasing impetus toward reducing the time assigned to spelling; and (2) the erstwhile professional power which the doctrine of correlation of subjects assumed. Further sanction of a scientific type was given by the investigations of Rice and Cornman into the teaching of spelling. Rice showed the waste of long-time periods under existing methods of instruction, and Cornman indicated that the prevalent special instruction in spelling was not superior in results to a careful and superior use of incidental teaching.

Thus changes in pedagogical practice, psychological criticisms, and a better appraisal of social demand have greatly affected the time allotment and time distribution in the teaching of spelling. They have diminished the percentage of school recitation-time given to the formal study of spelling, decreased the number of spelling periods per week, altered and varied the time distribution of these periods among the various grades, and in some places actually eliminated formal instruction in spelling.

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